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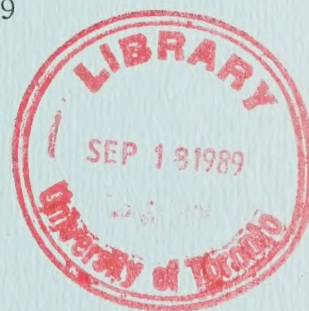
VOLUME: 131

DATE: Thursday, September 7th, 1989

BEFORE: M.I. JEFFERY, Q.C., Chairman

E. MARTEL, Member

A. KOVEN, Member



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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the
Honourable Jim Bradley, Minister of the
Environment, requiring the Environmental
Assessment Board to hold a hearing with
respect to a Class Environmental
Assessment (No. NR-AA-30) of an
undertaking by the Ministry of Natural
Resources for the activity of timber
management on Crown Lands in Ontario.

Hearing held at the Ramada Prince Arthur
Hotel, 17 North Cumberland St., Thunder
Bay, Ontario, on Thursday, September 7th,
1989, commencing at 8:00 a.m.


VOLUME 131

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	MINISTRY OF NATURAL
MS. C. BLASTORAH)	RESOURCES
MS. K. MURPHY)	
MS. Y. HERSCHER)	
MR. B. CAMPBELL)	MINISTRY OF ENVIRONMENT
MS. J. SEABORN)	
MR. R. TUER, Q.C.)	ONTARIO FOREST INDUSTRY
MR. R. COSMAN)	ASSOCIATION and ONTARIO
MS. E. CRONK)	LUMBER MANUFACTURERS'
MR. P.R. CASSIDY)	ASSOCIATION
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MR. J.F. CASTRILLI)	
MS. M. SWENARCHUK)	FORESTS FOR TOMORROW
MR. R. LINDGREN)	
MR. P. SANFORD)	KIMBERLY-CLARK OF CANADA
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MR. D. MacDONALD	ONTARIO FEDERATION OF LABOUR
MR. R. COTTON	BOISE CASCADE OF CANADA LTD.
MR. Y. GERVAIS)	ONTARIO TRAPPERS
MR. R. BARNES)	ASSOCIATION
MR. R. EDWARDS)	NORTHERN ONTARIO TOURIST
MR. B. McKERCHER)	OUTFITTERS ASSOCIATION



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APPEARANCES: (Cont'd)

MR. L. GREENSPOON) MS. B. LLOYD)	NORTHWATCH
MR. J.W. ERICKSON, Q.C.) MR. B. BABCOCK)	RED LAKE-EAR FALLS JOINT MUNICIPAL COMMITTEE
MR. D. SCOTT) MR. J.S. TAYLOR)	NORTHWESTERN ONTARIO ASSOCIATED CHAMBERS OF COMMERCE
MR. J.W. HARBELL) MR. S.M. MAKUCH)	GREAT LAKES FOREST
MR. J. EBBS	ONTARIO PROFESSIONAL FORESTERS ASSOCIATION
MR. D. KING	VENTURE TOURISM ASSOCIATION OF ONTARIO
MR. D. COLBORNE	GRAND COUNCIL TREATY #3
MR. R. REILLY	ONTARIO METIS & ABORIGINAL ASSOCIATION
MR. H. GRAHAM	CANADIAN INSTITUTE OF FORESTRY (CENTRAL ONTARIO SECTION)
MR. G.J. KINLIN	DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC	MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES	ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI	BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY

(iii)

APPEARANCES: (Cont'd)

MR. R.L. AXFORD	CANADIAN ASSOCIATION OF SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

(iv)

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I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
771B	Document entitled: Winter Utilization by Moose of Glyphosate-Treated Cutovers, an Interim Report, by Conner and Gratz, subsequently cited as Connor and McMillan.	22142
789	Letter from Dr. F. Y. Chang at Agriculture Canada to Kathleen Murphy, dated August 28th, 1989.	22143
790	Article entitled: Uptake and Excretion of Organophosphorus and Carbamate Insecticides by Fresh Water Fish, Motsugo, authored by Jun Kanazawa.	22245
791	Article entitled: Relationship Between the Molecular Rates of Pesticides and Their Bioconcentration Factors by Fish, by Jun Kanazawa, published in Experientia Journal.	22245
792	Report entitled: Persistence of Carbaryl (Sevin-4-Oil) in Woodland Ponds and Its Effects on Pond Macroinvertebrates following Forest Spraying by Gibbs, et al, 1984.	22255
793	Article entitled: Short- and Long-Term Effects of Forest Spraying of Carbaryl (Sevin-4-Oil) on Stream Invertebrates by Courtemanch and Gibbs.	22259
794	Extract of a document entitled: Aminocarb: The Effects of Its Use on the Forest and the Human Environment, dated 1982, National Research Council of Canada.	22273

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<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
795	Article entitled: Effects of Carbaryl-Induced Depression in Invertebrate Abundance on the Growth and Behaviour of American Black Duck and Mallard Ducklings, authored by Malcolm Hunter, Jack Witham and Hillary Dow, dated 1984.	22285
796	Study by Wood and Stewart, 1976	22344
797	Abstract of a study entitled: New Brunswick Forest Spray Operations, Field Study of the Effects of Atmospheric Stability on Long Range Pesticide Drift by Crabbe, et al, National Research Council of Canada, National Aeronautical Establishment.	22348
798	Article written by Ecobicon and Walters presented at the 1986 Buffer Zone Conference.	22353
799	Article entitled: Aerial spraying of fenitrothion in forest programs: some problems and solutions, authored by D.J. Ecobichon.	22379
800	Article entitled: The Evolution of Buffer Zones for Forest Insect Spraying in New Brunswick by W.A. Sexsmith.	22381
801	Copy of 1989 Spray Permit Issued by Minister of Municipal Affairs and Environment, Province of New Brunswick, with names of parties deleted.	22386

Index of Exhibits (Cont'd)

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
802	Article entitled: Buffer Zones for Maine's Spruce Budworm Suppression Operations, by Stephen Oliveri.	22389
803	Document entitled: Buffer Zones: Their application to forest insect control operations, Proceedings of the Buffer Zone Conference, Eastern Spruce Budworm Council's Environmental Committee, Quebec City, April, 1986.	22411
804	Two-page document entitled: Table 1. Summary of buffer zones applied to spruce budworm control operations in various jurisdictions, April, 1986.	22434
805	Report on the Board's Site Visit May 23rd through May 26th, 1989.	22449

1 ---Upon commencing at 8:10 a.m.

2 THE CHAIRMAN: Good morning. Please be
3 seated.

4 MS. MURPHY: I had a couple of little
5 clean-up items. I thought it might be wise to try and
6 deal with them first, Mr. Chairman.

7 First of all, it came to my attention
8 that as a result of some perhaps confusion at the end
9 of the day, or last day there was an exhibit entered as
10 Exhibit 771 and the first difficulty was that the title
11 that was given to the exhibit for the purposes of the
12 record was inaccurate, and at present the exhibit is
13 identified in the record as: Early Winter Utilization
14 by Moose of Glyphosate Treated Cut-Overs, a B.Sc. in
15 Forestry thesis by Connor and Gratz.

16 In fact I think, as you will recall,
17 there was a bit of confusion about what document was
18 the B.Sc. thesis, what document was actually the
19 article.

20 The document that was provided and made
21 the exhibit was actually the article, it was not the
22 thesis and the actual title of the article was: Winter
23 Utilization by Moose of Glyphosate Treated Cut-Overs by
24 Connor and Gratz, an Interim Report, and that was -- it
25 was advised that that was published in Alces, which is

1 A-l-c-e-s, the 24th Volume, 1988. That was the first
2 difficulty.

3 The second one was though that in the
4 interim I have received a final published version of
5 that document and I thought it would be wise perhaps to
6 enter that on the record, primarily because in future
7 when that document is cited they would be citing the
8 actual final version, and the one thing about it that
9 should be noted is that the article is now to be cited
10 as being by Connor and McMillan rather than Gratz.
11 What has happened is that Ms. Gratz became Mrs.
12 McMillan in the interim.

13 THE CHAIRMAN: We offer her our
14 congratulations.

15 MS. MURPHY: So I thought it would wise
16 to perhaps make that a part of the exhibit, but make
17 sure that the exhibit is identified properly so that in
18 future citations people can locate it.

19 THE CHAIRMAN: And what do you want to
20 do, do you want to give it a number?

21 MS. MURPHY: Perhaps give it -- just
22 identify the exhibit as Connor and Gratz, Winter
23 Utilization by Moose of Glyphosate Treated Cut-Overs,
24 an Interim Report, subsequently cited as Connor and
25 McMillan.

1 THE CHAIRMAN: But the same number?

2 MS. MURPHY: Yes.

3 THE CHAIRMAN: Okay.

4 MS. MURPHY: It's the same article with
5 some typographical corrections.

6 THE CHAIRMAN: Very well.

7 MR. HANNA: Mr. Chairman, might I suggest
8 that we call this 771A and B. I have not seen this new
9 article and I am not certain what changes -- this is
10 the first time it has come to my attention. I have no
11 idea what changes might have occurred between the
12 original and this article.

13 MS. MURPHY: That's fair enough.

14 THE CHAIRMAN: All right. So this
15 document tendered today will be Exhibit 771B.

16 ---EXHIBIT NO. 771B: Document entitled: Winter
17 Utilization by Moose of Glyphosate
18 Treated Cut-Overs, an Interim
19 Report, by Connor and Gratz,
subsequently cited as Connor and
McMillan.

20 MS. MURPHY: A second item I have, as you
21 will recall Mr. Kingsbury was asked to make some
22 inquiries by Mr. Castrilli.

23 On August 31st I received a letter, this
24 is a letter from Dr. Chang at Agriculture Canada and
25 that is in response to that matter. I thought perhaps

1 we'd just file it at this time. So that's a letter
2 from Dr. F.Y. Chang to me, Kathleen Murphy. The letter
3 is dated August 28th, 1989.

4 THE CHAIRMAN: All right. That will be
5 Exhibit 789.

6 MS. MURPHY: (handed)

7 THE CHAIRMAN: Thank you.

8 ---EXHIBIT NO. 789: Letter from Dr. F.Y. Chang at
9 Agriculture Canada to Kathleen
Murphy, dated August 28th, 1989.

10 MS. MURPHY: There was one last matter I
11 wished to raise. In reviewing some of the transcript
12 from the previous testimony of these witnesses I note
13 that there is a difficulty with the word adsorption -
14 which is 'ad' rather than 'ab' - and I think it will
15 probably be difficult for the reporter to go through
16 and find which words are correct.

17 I thought it should be noted on the
18 record that when reading, in particular the evidence
19 Mr. Kingsbury, one should take close attention to the
20 context and ensure that what he's actually saying is
21 adsorption which is normally written in the transcripts
22 as absorption and which concepts are quite different,
23 as I understand.

24 And perhaps Mr. Kingsbury could help by
25 just explaining what the differences are.

1 MR. KINGSBURY: I guess, just to put it
2 as simply as I can, the difference between adsorption
3 and absorption is the difference in the preposition
4 onto and into. So it's relating basically to ability
5 of a chemical to penetrate into or to simply cling onto
6 a substrate. Does that suffice?

7 THE CHAIRMAN: Yes, it does. Does this
8 occur often, Ms. Murphy?

9 MS. MURPHY: I think it's consistent as a
10 matter of fact. And my understanding would be that Mr.
11 Kingsbury was generally saying adsorption and, in fact,
12 in the transcript it says absorption and I would
13 suggest that in probably a hundred per cent of the
14 cases it was meant to be adsorption with a 'd'.

15 THE CHAIRMAN: So then for the purposes
16 of the record we can effectively correct that now by
17 indicating that wherever the word 'absorption' occurs
18 it should in fact be 'adsorption'.

19 MS. MURPHY: Yes, particularly with
20 reference to the evidence of Mr. Kingsbury, I think
21 that that's accurate.

22 THE CHAIRMAN: Yes. Okay, thank you.
23 Mr. Hanna?

24 MR. HANNA: Good morning. Just to give
25 you a brief idea of where I'm going. I have indicated

1 to the Board that I will take two hours and I am going
2 to do my very best to stick to that.

3 Just to give you an idea of what I'm
4 going to cover. I'd like to just deal with a few minor
5 matters that came up in the transcripts of the last
6 cross-examination with Mr. Kingsbury, and then I
7 believe there is one other minor issue with the ESSA
8 Report.

9 I would then like to review with Mr.
10 Kingsbury what is now I guess the Connors and McMillan
11 report, and I then have a few questions on the Moose
12 Habitat Guidelines and I should be finished.

13 So that's what the agenda is for the
14 remainder of my cross-examination.

15 PETER KINGSBURY,
16 LEONARD RITTER, Recalled

17 MR. HANNA: Good morning, Mr. Kingsbury.

18 MR. KINSBURY: Good morning, Mr. Hanna.

19 MR. HANNA: I see you arrived on the same
20 late flight I did last night, and I hope you got a
21 better sleep than I did.

22 CONTINUED CROSS-EXAMINATION BY MR. HANNA:

23 Q. There is a couple of matters I'd like
24 to refer to our last discussion, Mr. Kingsbury. First
25 of all, I would like you to turn to page 21458 in

1 Volume 126?

2 MR. KINGSBURY: A. Yes, I have it.

3 Q. Okay. And this is -- you remember
4 that we had a fairly long-winded discussion of conifer
5 content and trying to get our terminology correct and
6 whatever on that, and this was sort of the beginning of
7 that. We were discussing Table 4 on page 647 of
8 Exhibit 722. You recall that?

9 A. Okay.

10 Q. It's the Newton study?

11 A. Yes.

12 Q. And we were looking at the far right
13 column which is that that refers to the condition
14 greater than one year after treatment; correct?

15 A. Yes.

16 Q. Now, the question that I was asking,
17 and I was looking at that column and I said -- I can
18 actually read it directly out, it was:

19 "Does it not suggest..."

20 That right-hand column:

21 "...that the impact in this particular
22 case of glyphosate is much longer than
23 any of the other treatments?" And we
24 ended up going around and talking about precommercial
25 thinning and various other things, and I just want to

1 get that one minor point sorted out first.

2 A. What you would like me to agree to is
3 the fact that the condition of the foliage greater than
4 one year after treatment in the glyphosate-treated
5 blocks suggests that there is still some impact of the
6 chemical apparent--

7 Q. Yes.

8 A. --in those blocks as opposed to the
9 other blocks?

10 Q. Yes.

11 A. To the extent that, obviously it's
12 not a whole lot of data to go on, but it indicates that
13 the foliage in those blocks was yellow and deformed,
14 whereas it's defined in other blocks as being mostly
15 recovered, fully recovered, good colour, small leaves.

16 So it certainly suggests that there's a
17 visual difference in the condition of the foliage on
18 those blocks.

19 Q. Okay. Now, later on in page 21459 of
20 the transcript --

21 A. Yes.

22 Q. It was all part of the same
23 discussion we were having on conifer content, whatever.
24 You made reference to an example there, it's the answer
25 that starts on line 7.

1 A. Sublethally impacting on a --

2 Q. Right. We are talking about this
3 sublethal -- the point of using herbicides for
4 sublethal impacts causing top dieback and then
5 subsequently sprouting, and that was the examples you
6 were giving; is that not correct?

7 A. That's what I was talking about as
8 not an intended effect necessarily, which you may have
9 implied in your question, but simply saying that if you
10 have a sublethal effect on some species of browse
11 plants you may in fact enhance their growth, and that
12 certainly has been suggested in the literature for
13 other chemicals.

14 Q. Right. But the discussion here, and
15 I -- just to clarify so that we can move here as
16 quickly as possible this morning, I'm really focusing
17 primarily on glyphosate.

18 A. Yes.

19 Q. Okay. So just so that's clear, and
20 the suggestion that's given here, this sublethal effect
21 in a positive way of increasing browse as a result of
22 that. The question is: Does that apply to glyphosate?

23 A. I guess what my experience would tell
24 me is the fact that greater than one year after
25 treatment the fact that the plant has continued to

1 produce new leaves, obviously the leaves are a new crop
2 of leaves that have been produced after treatment, is
3 saying to me that the plant has been sublethally
4 impacted.

5 Now, I think that in the vast majority of
6 situations such plants are going to live, they are not
7 going to die two or three years after the herbicide
8 application.

9 I think that a plant physiologist would
10 back me up on that, that if in fact the material is
11 applied and the plant greater than a year after has
12 produced with some sign of still being affected by the
13 chemical, a crop of leaves, probably that plant will
14 live, okay?

15 Q. Okay. But --

16 A. I would still like to get away from
17 the idea that I'm suggesting that this is a great
18 enhancement of browse. I'm trying to indicate that
19 this suggests that these species may in fact not be
20 eliminated as browse, and the fact that there has been
21 some top killing may at some point in time mean that
22 there's as much or more browse produced within the
23 grazing height of moose somewhere down the line.

24 Q. If it was your intention to cause
25 sublethal effects and resprouting to encourage moose

1 browse, would glyphosate be the herbicide of choice or
2 would you be more likely to choose one of the phenoxy
3 herbicides?

4 MS. MURPHY: Excuse me, I think the
5 witness started his discussion by saying I agree that
6 what happens here is not intended.

7 MR. HANNA: That's perfectly fine. The
8 question doesn't have -- is a new subject and I'm
9 asking the witness a new question, it's quite
10 independent.

11 THE CHAIRMAN: Go ahead.

12 MR. HANNA: Q. Would you like me to read
13 that again or do you -- okay. Fine, go ahead, Mr.
14 Kingsbury.

15 MR. KINGSBURY: A. I think that's a
16 little simplistic to say that if the intent of the
17 herbicide application was to in fact stimulate browse,
18 I'm sure that you could do a better job with a mixture
19 of chemicals or in other ways.

20 Obviously here what's important is the
21 dosage you applied and the range of species that you
22 were trying to stimulate. Probably what you would want
23 to do is apply a lethal dosage of materials that would
24 eliminate things that are going to compete with your
25 browse species, provided that you could come up with an

1 application rate of those materials that would not back
2 your browse species, kill them.

3 Q. It sounds like you've some experience
4 in this. Can you give me an example?

5 A. I wouldn't suggest I have great
6 experience in doing it, I'm simply saying that I
7 believe that -- and one of the reasons that you
8 sometimes see herbicide mixtures being applied is
9 because naturally when we talk about herbicides we're
10 talking about variable effects on a wide range of plant
11 species from any one material that is dose related,
12 which simply means that one can presumably manipulate
13 application rates and material applied to more or less
14 finally impact on a variety of species and if you -- I
15 would suggest there probably isn't a great deal of
16 actual experience out there where people have attempted
17 to use this. Probably something like a prescribed burn
18 might be a much more economical and better way to
19 stimulate moose browse.

20 Again though, Mr. Hanna, if my testimony
21 is indicating to the Board that glyphosate applications
22 routinely, immediately after they are applied, lead to
23 a great stimulation of moose browse, that's not the
24 intent of my testimony.

25 Q. But that is possible with phenoxy

1 herbicides; in fact, they've been used for that?

2 A. It is possible, yes, and it would be
3 possible I would suggest with glyphosate as well. I
4 don't see any reason why an application rate of
5 glyphosate with a given plant community wouldn't have
6 the same effect. It would obviously be designed for a
7 very different purpose and would be a lower application
8 rate than what would be effective for, say, a release
9 treatment.

10 Q. The application rates in this paper,
11 and particularly on Table 4 on page 647, the low
12 application rate, would that be comparable to what we
13 would use in an operational way in Ontario?

14 A. I mentioned before that in the States
15 there is a higher application rate registered. I'd
16 want to check to make sure. I'm not sure that 1.65 is
17 exactly in line with the Canadian -- it's close.

18 Q. It's close?

19 A. Yes.

20 Q. Can we look again on page 647 in the
21 left-hand column, the first full paragraph, and I'm
22 reading there -- the sentence starts with:

23 "The origins of plants, sprout or
24 seedling... "

25 Do you see that sentence there, left-hand

1 side, first full paragraph.

2 A. Yes, I see it. The second sentence:
3 "The browse index range..."-- "Origin of plants..."
4 Yes, I...

5 Q. "Origin of plants..."

6 Now, I read that, and my interpretation
7 of that is that glyphosate has a very different impact
8 in terms of its effect on regeneration of sites than
9 phenoxy herbicides. Am I reading something wrong into
10 that?

11 A. I think what that is saying is that
12 in this experiment with the application rates that were
13 applied -- I would interpret this as saying that
14 basically the phenoxies applied at those rates in this
15 instance were not as effective at killing plants that
16 were already on the site as the triclopyr and
17 glyphosate.

18 Q. So you're suggesting this statement
19 has no broader applications?

20 A. Certainly it would indicate that at
21 these application rates on these kind of sites the
22 glyphosate and triclopyr were more effective for the
23 purposes intended than the phenoxies.

24 Q. That wasn't my question, Mr.
25 Kingsbury. My question was: Can I take this as being

1 a general rule of thumb or would you say this only
2 would apply in this particular site, that I cannot make
3 that sort of an -- that sort of conclusion on a general
4 basis?

5 A. I would caution you about making it
6 as a generalization without recognizing what the site
7 conditions are because of the variability of tolerance
8 of the wide range of plant species that we're talking
9 about as being moose browse to all of these chemicals.

10 Q. But these authors had no problem with
11 that, they had a very wide range of species and yet
12 they were able to make this statement categorically;
13 were they not?

14 A. I think we're into semantics here. I
15 wouldn't like to put it in the author's mouth how
16 categorically they would apply this statement to other
17 situations.

18 You are asking me to do something that I
19 just don't feel I can do, is -- you know, say how
20 widely the authors would apply this statement if they
21 were asked. You know, you would have to put it to
22 them: Does this apply to all sites in Ontario.

23 Q. Imagine yourself, Mr. Kingsbury,
24 you've been there before, with a pesticide regulation
25 Board where you're talking about a very general type of

1 situation, you're not talking about a site-specific
2 case, and you were asked: By and large on most sites
3 in Ontario, when I was comparing the effects of phenoxy
4 herbicides versus the impact of glyphosate, would you,
5 Mr. Kingsbury, expect that glyphosate is more likely to
6 cause seedling regeneration to be the dominant measure
7 of regeneration or resprouting, in a very general way?
8 We are faced with those questions regularly.

9 A. I would indicate that we probably
10 would feel that glyphosate is going to take out mature
11 plants at -- if it's an effective application, it
12 probably will take out a wider range of species as
13 mature plants which then would obviously have to
14 reoccupy the site through seedlings.

15 Q. And it's more likely to kill the root
16 system and prevent suckering than phenoxy herbicides?

17 A. Of some plant species, but not all.
18 One of the reasons that phenoxies have been associated
19 with this resprouting from root systems is because they
20 weren't as effective on some of the intended targets as
21 glyphosate is.

22 Q. Those targets that glyphosate is more
23 effective on, are those usually the preferred species
24 for moose browse?

25 A. I wouldn't like to agree with that as

1 a generalization because I think that -- and I've
2 cautioned yourself and the Board repeatedly, one needs
3 to look, you know, at specific tolerance of the species
4 you're considering, and I would caution that there
5 certainly is lots of information available saying that
6 the preferred browse species to moose varies from site
7 to site, varies from time of year, very much so, can
8 even vary to a certain extent whether you're talking
9 about males or females or young with calves. That's a
10 generalization I would caution against.

11 Q. Well, unfortunately that's one of the
12 problems you're faced with in these sort of hearings,
13 is that we are talking about all of the province.

14 Can we turn to 21472 in the transcripts,
15 please?

16 A. Give me that number again, please?

17 Q. 21472. This is a continuation of our
18 discussion about conifer content, and I don't want to
19 go back through that again, but I noted there seemed to
20 be a misunderstanding there.

21 And my reading of your answer was that --
22 I'm looking now on 21473 when I was asking you about
23 conifer content and your response was -- you're
24 talking -- this is referring to precommercial thinning.
25 Do you recall that discussion that we had?

1 A. I recall the discussion, but I just
2 can't put myself at the point in it that you --

3 Q. Okay, fine. Take a moment and...

4 A. Perhaps if you could go on with a
5 specific question that I can try and address.

6 Q. Okay. Your answer was that we're
7 talking here about spacing when it says intensity of
8 precommercial thinning and the inference was that
9 doesn't relate to conifer content.

10 My questions were related to conifer
11 content and you said: well, in this article where you
12 were referring me to it's talking about precommercial
13 thinning.

14 A. I'm a little lost here, but I think
15 basically I was trying to say that I'm talking about a
16 treatment, a silvicultural treatment and I think you
17 were trying to talk about the site.

18 I would really have to go back and review
19 this discussion to be able to get to where you're -- to
20 be able to comment meaningfully on where you want to me
21 comment on it at the moment, Mr. Hanna.

22 My impression at the time was that - and
23 this is from recollection that I probably shouldn't
24 do - is that we were talking -- I was trying to say
25 that the spacing was a treatment that was a management

1 treatment that was selected and was independent of the
2 herbicide treatment. Maybe I'm misleading you.

3 Q. Fine. But is it not a fact that
4 precommercial thinning is indeed a means to manage the
5 conifer content of a stand?

6 A. Yes.

7 Q. So, therefore, despite the fact how
8 that occurs, the discussion on page 647 starting under
9 Management Implications and talking about if you've got
10 a three by three or a two by two spacing and the
11 consequences in terms of moose browse, does pertain to
12 conifer content of the stand despite how you -- how
13 that is accomplished?

14 A. I think -- again, my difficulty is in
15 the conflict between what you feel it is that I
16 contradicted in terms of your intent.

17 Q. Well, my question started very
18 simply. It was: Does the conifer content not affect
19 the response of the stand in terms of moose browse
20 that's observed in this paper?

21 MS. MURPHY: Where was that question?

22 MR. HANNA: Certainly.

23 MR. KINGSBURY: The response to --

24 MR. HANNA: It's on page --

25 MR. KINGSBURY: The response of the stand

1 to the herbicide treatment. Is that what you're
2 saying?

3 MR. HANNA: Q. I'll read the question.
4 It's on page 21473 starting on line 15:

5 "My question was: "does the conifer
6 component affect the response in terms of
7 browse quality and quantity?"

8 MR. KINGSBURY: A. Does the conifer
9 component affect the response of the plant community on
10 the site to the herbicide treatment in terms of what it
11 will then provide as moose browse quantity and quality.
12 That's what you're saying?

13 Q. Can we look on page 647.

14 A. Yes.

15 Q. The last sentence in the left-hand
16 column, it says:

17 "Where potentially tall hardwoods have
18 been removed by herbicides, the increase
19 in conifer dominance will eventually
20 suppress shrubs and reduce available
21 browse."

22 A. Yes.

23 Q. If the conifer content is higher in a
24 stand, will conifer dominance occur more quickly?

25 A. Yes.

1 Q. So conifer content does affect the
2 response of the stand in terms of available browse?

3 A. Without any reference to herbicide
4 treatments?

5 Q. Yes.

6 A. Yes.

7 Q. And it affects the response after
8 herbicide treatment also?

9 A. I guess what I was trying to avoid is
10 the suggestion that the -- of what I was taking to be
11 an implication that the conifers on the site somehow
12 affected the response of the other vegetation.

13 Q. That certainly is the implication.

14 A. That is the implication you are
15 making?

16 Q. Yes.

17 A. Okay. To the extent that eventually
18 the browse on the site may be limited by the growth of
19 the conifers and the competition with browse that
20 conifers provide, yes.

21 Q. And that's what these authors
22 concluded also, that's in fact what the article or the
23 sentence I just read essentially is saying; is that not
24 right?

25 A. The sentence being the second --

1 Q. "Where potentially tall hardwoods..."

2 A. Yes.

3 Q. Now --

4 A. Okay. It says:

5 "Where potentially tall hardwoods have
6 been removed by herbicides..."

7 Q. Correct.

8 A. Okay. That does not apply in this
9 study. That is my understanding. Is that what you are
10 suggesting is the case in this study? Because my
11 understanding is that these sites we are dealing with
12 in this study have all been clearcut seven years prior
13 to treatment.

14 Q. And we have established that the
15 hardwoods on the site were over 8 feet tall?

16 A. I guess this is part of the problem.
17 When you say tall hardwoods, I am not considering an
18 8-foot tall aspen as being a tall hardwood in the
19 context of this data set, and maybe that is the
20 problem.

21 Q. Well, the next sentence - Mr.
22 Kingsbury, I certainly didn't expect this to go this
23 long - but the next sentence makes a conclusion based
24 upon the sentence we have just read.

25 It says:

1 "In some areas, therefore, conifer growth
2 and the period of browse availability
3 would be maximized by early release with
4 herbicides followed by precommercial
5 thinning."

6 Now, how do they come to that conclusion,
7 that 'therefore conclusion' if it doesn't relate to
8 that sentence?

9 A. Okay. You are suggesting there that
10 that conclusion is inappropriate?

11 Q. Hardly. I'm suggesting they have
12 arrived at a conclusion. My understanding of logic is
13 you make a premise and you make a conclusion. They've
14 made a premise and they said, therefore, this is the
15 conclusion.

16 A. And you want me to basically comment
17 on that conclusion on the basis of the premise?

18 Q. I think that's fair, yes.

19 A. Okay.

20 "In some areas conifer growth and the
21 period of browse availability would be
22 maximized..."

23 So we are dealing with two things there,
24 all right, conifer growth and period, okay. To me that
25 means time frame that browse is available.

1 I guess what they are trying to do here
2 is to look at the dynamic system where both your browse
3 and your conifers are growing over time and suggesting
4 that in some areas knocking back your browse by
5 herbicide treatment combined with a subsequent opening
6 up through thinning of the conifer component, both of
7 these things over time may at different points in the
8 cycle bring more browse within the range of moose on
9 some sites.

10 Q. Mr. Kingsbury, this is really a
11 simple issue. The issue is this: We have got results
12 here, we have got authors saying that the results are
13 dependent upon the conifer content of the stand.

14 I asked you before what is the conifer
15 content of this stand so I can interpret these results.
16 Well, I can't - I haven't been able, and since I have
17 spoken with you I have looked again - I can't find the
18 conifer content of the stand.

19 How do I interpret these results, what is
20 the implications of these results without having that
21 information?

22 MS. MURPHY: Well, we have been around
23 this 15 times now. With respect, the whole thing
24 started some time back when my friend asked Mr.
25 Kingsbury at page 21471:

1 "Would the level of response to herbicide
2 application to deciduous trees and shrubs
3 be affected by the conifer component in
4 the stand?"

5 And we have just gone around and around
6 and around this, and I think the witness has said that
7 it depends on a number of factors, and that is pretty
8 much the end of it. I don't know how much farther we
9 can go with it.

10 THE CHAIRMAN: Do you have anything to
11 add to what your counsel just said, Mr. Kingsbury?

12 MR. KINGSBURY: Mr. Chairman, I just
13 suggest that I am not trying to be obstreperous, I am
14 just quite confused and perhaps it's because Mr. Hanna
15 and I have a very different mental picture of this site
16 and the vegetation on it. That is all I can suggest.

17 THE CHAIRMAN: Okay. Mr. Hanna, where do
18 we go from here? What turns on this question?

19 MR. HANNA: Well, I think a lot turns on
20 it, Mr. Chairman. I am convinced, having spoken to
21 this witness -- anyway, I can deal with this in my own
22 evidence, and that is what I will propose to do.

23 THE CHAIRMAN: Very well.

24 MR. HANNA: Q. Can we turn now, Mr.
25 Kingsbury, to page -- 604C, page 74, that is the ESSA

1 Report.

2 MR. KINGSBURY: A. Yes, I have it.

3 Q. It's page 74.

4 A. Yes.

5 Q. And looking at the second -- well,
6 it's the first full paragraph, the second paragraph in
7 the middle of the page. And this paragraph is
8 suggesting that herbicides can enhance browse
9 conditions for deer and moose, particularly dealing
10 with deer here, but I believe it also applies to moose.

11 A. They are talking about the response
12 you have been talking about of initiation of new growth
13 by herbs and shrubs and they are talking here
14 specifically about deer use and they suggest this may
15 be a short-term effect.

16 Q. The two studies that they quote for
17 that are Krefting and Hansen and Borreco; is that
18 correct?

19 A. Yes.

20 Q. Well, can you confirm that both of
21 these studies are referring only to 2,4-D and not to
22 glyphosate?

23 A. Certainly, they are pre-glyphosate.

24 Q. Thank you. Okay. Can we move now to
25 the Connor and McMillan paper, excuse me. If you will,

1 I would prefer to use 771A because that is the one that
2 I have marked up.

3 A. Okay.

4 Q. Is it your understanding that both of
5 the authors of this paper are Ministry biologists?

6 A. I believe so, or under contract. I
7 am not sure.

8 Q. Their study is centered within the
9 area of the undertaking; correct?

10 A. Yes.

11 Q. And, to the best of your knowledge,
12 this is the only study of its kind in Ontario now or in
13 the past?

14 A. When you say, of its kind in
15 Ontario...?

16 Q. Dealing specifically with glyphosate.
17 I realize that we have spoken of others dealing with
18 herb -- 2,4-D.

19 MS. MURPHY: My friend himself has
20 discussed an earlier work by Connor in 1986.

21 MR. HANNA: I stand corrected, Mr.
22 Chairman. Thank you, Ms. Murphy.

23 MR. KINGSBURY: I would -- I guess I
24 would agree, with the exception Ms. Murphy pointed out,
25 that it's one of the few studies that have gone beyond

1 looking at plant community and looked at actual
2 utilization by moose.

3 MR. HANNA: Q. Now, based on the
4 information contained in this paper regarding the
5 significant negative effects of glyphosate that were
6 present and exhibited by moose behaviour not some
7 abstract browse index --

8 MS. CRONK: Well, excuse me, Mr.
9 Chairman, I object to the editorial comment.

10 THE CHAIRMAN: It may not be abstract to
11 everybody, Mr. Hanna.

12 MR. HANNA: To the moose perhaps, but
13 perhaps not others.

14 THE CHAIRMAN: Well --

15 MS. MURPHY: My friend has said: Given a
16 series of things which he asserts are supported by this
17 document. He hasn't shown us this in the document,
18 that is the problem.

19 MR. HANNA: I was trying to deal with the
20 general conclusion first. I am intending to go through
21 it in detail, but -- well, this witness is quite
22 capable, Ms. Murphy, of - how should I say -
23 integrating scientific information and coming at a
24 general conclusion and I was asking for that general
25 view of this paper before I dealt with the details.

1 THE CHAIRMAN: I think you will get less
2 difficulty, Mr. Hanna, if you ask the witness a
3 question based on the document you are putting before
4 him.

5 MR. HANNA: Thank you, Mr. Chairman.

6 Q. Okay. Based on this paper, Mr.
7 Kingsbury, were there not significant negative effects
8 exhibited beginning at least seven months after the
9 herbicide spray and extending for at least 31 months
10 afterwards?

11 MR. KINGSBURY: A. Absolutely not, in
12 that if you - and I know the pages here aren't
13 numbered - if you will go to about the fourth page from
14 the back, just prior to the -- the page of text just
15 prior to Table 7.

16 Q. Perhaps, Mr. Kingsbury, before we go
17 any further --

18 A. No, I would like to finish this, Mr.
19 Hanna.

20 Q. No, no - just a matter of record, Mr.
21 Chairman - I would like you, Mr. Kingsbury, to use the
22 page numbers. In the exhibit I have page numbers.
23 Perhaps -- I don't know whether yours does.

24 A. Mine does not.

25 Q. Well, the one I entered as an exhibit

1 has page numbers on it. I don't know whether I have
2 another.

3 MS. BLASTORAH: I don't believe we were
4 provided with a copy of that exhibit at the time it was
5 filed, so we don't have one with page numbers.

6 THE CHAIRMAN: Well, the one the Board
7 has also is numbered starting with page 1 being the
8 page containing the authors' names and going through to
9 page 24.

10 MR. KINGSBURY: Okay. If I can just turn
11 you to page 19.

12 MR. HANNA: Q. Mm-hmm.

13 A. Okay. The first full paragraph in
14 that starts: "At 21 months post-spray...", is that
15 right?

16 Q. Yes.

17 A. Okay.

18 "...there were differences observed in
19 browse availability, browse utilized and
20 pellet groups per hectare on controls
21 versus treated areas."

22 The next sentence says:

23 "These differences were not statistically
24 significant."

25 However, for the reason that the authors

1 of the report do not conclude that the differences are
2 statistically significant, I would not agree with your
3 conclusion that there are significant differences or
4 significant impacts, sorry.

5 Q. So you have looked carefully at this
6 study and your conclusion -- your best judgment as an
7 expert, based upon the conclusions in this study, is
8 that you would conclude that there are no negative
9 impacts --

10 MS. MURPHY: He said significant.

11 MR. HANNA: Q. No significant impacts
12 from glyphosate applications. Is that your conclusion?

13 MR. KINGSBURY: A. That's not my
14 conclusion, Mr. Hanna. What I was commenting on in my
15 last response was the authors' conclusions which I
16 believed you paraphrased as saying there's significant
17 negative impacts on moose, and I pointed out that the
18 authors did not determine statistically significant
19 differences in the parameters that they indicated.

20 I would interpret this paper as providing
21 evidence that moose browse and some evidence that moose
22 utilization of the browse on treated sites at certain
23 times in the study suggested moose found less food and
24 used less food on the glyphosate-treated sites,
25 although these were not statistically significant

1 differences.

2 Q. Okay. But we are going to go through
3 all -- believe me, we are going to go through this and
4 you are going to have an opportunity to give me the
5 detail. I am trying to deal at the higher level first.
6 I am trying to look at this as the evidence that you
7 presented to this Board.

8 You now have this paper and I'm asking
9 you: Based upon this, does this impact and any of the
10 conclusions reached, would this suggest to you that
11 there may in fact be negative impacts associated with
12 glyphosate? Does this not suggest that there might be
13 potentially negative impacts associated with glyphosate
14 use on moose browse and utilization of moose browse?

15 A. Certainly there is no question that
16 the utilization of glyphosate is going to reduce browse
17 available to moose to different extents and for
18 different lengths of time on some sites.

19 I guess when you talk about impact on
20 moose we better start talking about -- are we talking
21 about an individual moose on this site, are we talking
22 about moose populations?

23 Q. Okay.

24 A. I am not going to agree that there is
25 significant impacts on moose without you defining are

1 we talking -- you know, talking about populations, what
2 is the size of use, is their entire habitat being
3 impacted in these ways.

4 Q. My question was on moose behaviour.
5 My original question was: Does this study not show
6 that there are significant negative impacts of
7 glyphosate on moose behaviour beginning at least seven
8 months after herbicide spray and extending for at least
9 31 months. And your answer was no.

10 THE CHAIRMAN: No, his answer wasn't no;
11 his answer was, the authors themselves indicate that
12 there are not statistically significant differences.

13 MR. HANNA: But I am asking for his
14 interpretation, Mr. Chairman. I understand what the
15 authors' interpretation is. The authors have given
16 their analysis of the data, they have also given the
17 data and I am asking this witness to look at this data
18 and to give me his opinion as to what conclusion he
19 would reach.

20 THE CHAIRMAN: All right. Do you agree
21 with the authors, Mr. Kingsbury?

22 MR. KINGSBURY: I would agree with the
23 authors, yes.

24 THE CHAIRMAN: Do you agree with the
25 authors that, notwithstanding the data they used, there

1 were not statistically significant differences?

2 MR. KINGSBURY: I am sorry, Mr. Chairman,
3 repeat that.

4 THE CHAIRMAN: Do you agree with their
5 caveat that they have put in their paper that
6 notwithstanding the data they used there doesn't appear
7 to be statistically significant differences?

8 MR. KINGSBURY: Yes.

9 MR. HANNA: Q. Would you use
10 statistically significant in the way that it is termed
11 here as a basis upon which to decide whether there
12 would be potentially significant impacts or not from a
13 management point of view?

14 MR. KINGSBURY: A. Not from a management
15 point of view, no, because I would want to know a lot
16 more about the habitat requirements of moose in a
17 specific area where these kind of effects were taking
18 place.

19 Q. That is fine. But I am asking you as
20 a manager faced with this study, would you reject it
21 because there is a lack of statistical significance
22 using the statistical test in this paper?

23 THE CHAIRMAN: But isn't he saying, in
24 effect, Mr. Hanna, that as a manager he would require
25 more data.

1 MR. HANNA: I am asking him, in the
2 absence of that data then he would have to reject this
3 paper.

4 MS. MURPHY: He didn't say anything about
5 rejecting anything.

6 THE CHAIRMAN: He may not be able to use
7 this paper to found a particular conclusion without
8 additional data. Isn't that what he's saying?

9 MR. KINGSBURY: Not only that, but I
10 would interpret it that this paper does not in fact
11 deal with the question of impact of glyphosate on moose
12 populations in an area, it doesn't even attempt to do
13 that, nor does it comment on that.

14 MR. HANNA: Q. Mr. Kingsbury, I have
15 this - this is all jumping ahead, but now that you have
16 raised it we might as well deal with it. Can you turn
17 to page 21, please. If you look at the last
18 paragraph -- last sentence:

19 "This may be particularly important for
20 the productive component of the
21 population especially cows with calves."
22 Are you suggesting that that is not
23 commenting on population effects?

24 MR. KINGSBURY: A. Let's get this into
25 context, Mr. Hanna.

1 Q. Go ahead.

2 A. What the authors are saying here in
3 this statement is that they are commenting on a
4 statement: Moose may have preferred - may have
5 preferred - the control areas because of greater energy
6 returns over the winter period.

7 Now, I would suggest the authors would in
8 no way conclude that they have even measured that
9 question of whether there were energy returns.

10 Q. Mr. Kingsbury, your comment was that
11 they did not comment upon population level effects. Is
12 this not a population level effect and isn't that what
13 they are commenting on?

14 A. No, it's not.

15 Q. This is not. Productive component of
16 the population does not refer to the population?

17 THE CHAIRMAN: Well, Mr. Hanna, they are
18 qualifying it by the fact that it may have this kind of
19 effect; it also may not have this kind of effect.

20 I think what Mr. Kingsbury is indicating
21 is that, in his view, they did not look at this problem
22 in any kind of scientific way. They are making a
23 comment that this may be an effect; it also may not be
24 an effect.

25 MR. HANNA: Mr. Chairman, unless my

1 memory is wrong, this witness just said they did not
2 even go as far as to comment on it and I believe that
3 this -- I can't get a more obvious comment, in my view.

4 THE CHAIRMAN: Well, I guess in that
5 sense, Mr. Kingsbury, you are wrong in that they did
6 comment. Whether there is any substance to the comment
7 from a scientific point of view is another question.

8 MR. KINGSBURY: But I would caution that
9 in talking about populations, this kind of a thing is
10 done in the abstract, it's saying here that there
11 may -- the moose may have preferred these areas because
12 of greater energy returns.

13 Now, I think if you go to the body of
14 literature on moose biology it will definitely indicate
15 to you that moose are not restricted to areas that have
16 the greatest energy returns for them, you know, we find
17 cows and calves out grazing in the middle of clearcuts
18 in the middle of winter when everything in the
19 literature suggests that's not the place where they
20 would get the greatest energy return.

21 It's not -- it may not be a critical
22 factor in the population biology of the moose in that
23 area, in fact browse availability may not be, and that
24 is the general conclusion as to the situation in
25 Ontario, that moose in Ontario in general - if you want

1 me to make generalizations - are not limited by browse
2 availability.

3 MR. HANNA: Q. Did the trends -- the
4 impacts not get progressively worse over the period of
5 this study?

6 MR. KINGSBURY: A. The reductions in
7 browse available and utilized were only noted as the
8 study progressed.

9 Q. And they got progressively worse?

10 A. The magnitude of the difference
11 between the control and treated sites only really
12 became evident, I believe, at the 21-month data points.

13 Q. And they became progressively worse?

14 MS. MURPHY: After 21 months?

15 MR. HANNA: Q. After -- continually
16 through the -- progressively worse over the course of
17 the study?

18 MS. MURPHY: I think he's answered the
19 question, Mr. Chairman.

20 THE CHAIRMAN: Well, just hold on. Go
21 beyond the 21 months to whenever the study ended and
22 see if you can indicate whether or not the results were
23 progressively worse.

24 MR. KINGSBURY: Okay. It's my
25 understanding this study is ongoing. I don't have

1 information on the data points beyond that, and I would
2 suggest it's a highly appropriate part of the study
3 that needs to be considered.

4 It's an interim report and I think that
5 part of the value of this study is that it will give
6 managers an idea of what the cycle of browse
7 availability and moose utilization of that browse might
8 be over a number of years after a glyphosate treatment,
9 because I would suggest that even common sense is going
10 to say that that is going to be a dynamic that will
11 change, and that is the kind of information a manager
12 needs to know to manage moose.

13 MR. HANNA: Q. Given the data in this
14 paper, is it reasonable to expect that negative impacts
15 will persist for some time past the three years for
16 which the reports -- the observations are reported?

17 MR. KINGSBURY: A. That would be
18 speculation as to what is going to happen beyond the
19 data here.

20 Q. So what do you do in the case of a
21 manager not having that information and being faced
22 with making decisions today? Are managers not faced
23 with speculation, Mr. Kingsbury?

24 A. Mr. Hanna, I am just trying to keep
25 this kind of information within the perspective of

1 overall moose habitat requirements.

2 Q. I am too, and I think moose managers
3 are also, and they are faced with very difficult
4 decisions using limited data, data that may not be
5 statistically significant, that may not go for three
6 rotations of the forest and they have to make
7 decisions. And I am asking you: What would you
8 conclude in that situation?

9 THE CHAIRMAN: Mr. Hanna, it's fine to
10 speculate on what moose managers are doing or will do
11 based on lack of data, but in fact is it not the case
12 that they are doing something, they are managing for
13 moose?

14 MR. HANNA: Absolutely, Mr. Chairman.

15 THE CHAIRMAN: And is there not evidence
16 before the Board that the moose population is not doing
17 badly in terms of what the objectives are?

18 MR. HANNA: I would suggest to you, Mr.
19 Chairman, evidence has been presented to this Board by
20 the Ontario Federation of Anglers & Hunters that
21 suggests that that is not the case and I would refer to
22 the --

23 THE CHAIRMAN: Well, you may present that
24 evidence at some point in time. At least the evidence
25 at this point before the Board --

1 MR. HANNA: I disagree, Mr. Chairman. We
2 do have evidence before the Board that suggests that is
3 not the case and I would refer you to the
4 cross-examination of the Ontario Federation of Anglers
5 & Hunters of Mr. Hogg in Panel 11 and we presented at
6 that time evidence that suggests that there has been
7 major declines in the number of moose tags and Mr. Hogg
8 agreed that those moose tags are closely correlated to
9 the moose populations.

10 MS. MURPHY: Notwithstanding, because I
11 am sure what my friend is talking about is a matter of
12 argument, the point remains that my friend is now
13 trying to elicit from this witness how managers of
14 moose would deal with this kind of information.

15 That is something that has most
16 definitely been dealt with in the past by people who
17 were witnesses who are managers of moose and who do do
18 this kind of thing, and you have had evidence in the
19 past from those very people and examination by my
20 friend of those very people.

21 I suggest to you Dr. Euler for example,
22 Mr. Hogg for example, Mr. McNicol for another example.

23 MR. HANNA: I have no intention, Mr.
24 Chairman, of going back through and asking Mr.
25 Kingsbury how he would manage moose.

1 He's an expert who has come forward
2 before us in terms of pesticide impacts. We are now
3 talking about a very specific issue dealing with
4 herbicide applications and I am asking him, in his
5 expert opinion - which I submit is probably far in
6 excess of anything that the Ministry's average manager
7 has - how he would take this information and apply it
8 in the management sense?

9 MS. BLASTORAH: Mr. Chairman, I am sorry
10 to interrupt, but Ms. Murphy wasn't present during the
11 evidence of Panel 11 and I would just like to state on
12 the record that my recollection of the evidence of Mr.
13 Hogg was not as stated by Mr. Hanna, and if he can
14 refer me to something in the transcript to that effect
15 I would appreciate it, but I would just like to make
16 that comment.

17 MR. HANNA: I am quite prepared to make
18 that reference to Ms. Blastorah, Mr. Chairman.

19 THE CHAIRMAN: Okay. Mr. Hanna, I don't
20 think we are going to get anywhere pursuing with this
21 witness how he would manage moose, he is not put
22 forward as a manager of the moose population and that
23 is not his function.

24 He has given you his opinion based on
25 this study what he thinks the impacts might or might

1 not be in terms of the data present in this study. He
2 hasn't gone beyond that, other than to say, to go
3 beyond the data in this study would be speculation.

4 Now, you will have an opportunity at some
5 point in the case to call your witnesses to indicate
6 whatever those witnesses want to say in terms of the
7 impacts of glyphosate on the moose population.

8 MR. HANNA: We will endeavor to do that,
9 Mr. Chairman.

10 Q. Can we look at the abstract on page
11 1, Mr. Kingsbury.

12 MR. KINGSBURY: A. Yes.

13 Q. There are six measures of moose
14 abundance and utilization of the experimental area; is
15 that correct?

16 A. Are you referring to something
17 specific on this abstract, or...

18 Q. Well, they are all described there in
19 the second paragraph, yes.

20 A. Could you just spell out to me those
21 six that you are referring to?

22 Q. Well, each sentence deals with each
23 one. There are probably six sentences.

24 A. Okay. I won't argue with the number.

25 Q. Moose tracks -- there's moose tracks.

1 MS. MURPHY: It's not going to be on the
2 record, it's not going to be of any help to anyone
3 looking at the transcript. It might be faster, rather
4 than arguing, to simply say: There is this one, this
5 one, this one.

6 MR. HANNA: Thank you, Ms. Murphy. I am
7 looking for ways to expedite this.

8 Q. There is No. 1 moose tracks; correct?

9 MR. KINGSBURY: A. Yes.

10 Q. No. 2, number of moose track
11 aggregates?

12 A. Yes.

13 Q. No. 3, number of pellet groups?

14 MS. MURPHY: I am sorry, number of what?

15 MR. HANNA: Pellet groups.

16 Q. No. 4, available moose browse?

17 MR. KINGSBURY: A. Yes.

18 Q. No. 5, browse utilization?

19 A. Mm-hmm.

20 Q. And I have left one out.

21 A. Okay. You have got --

22 Q. Well accept there is five for now. I
23 believe there is a sixth one, but accept that there is
24 five.

25 A. Okay. But you wanted me to agree

1 that each of those is a measure of, or can be --

2 Q. Moose abundance and use of the site?

3 A. Well, obviously, available moose
4 browse isn't -- as you would argue, doesn't say
5 anything about moose abundance or use of the site, it's
6 not a direct measure of that.

7 Q. I didn't suggest that it was a direct
8 measure, I simply said --

9 A. It's relevant. Mr. Hanna, I --

10 Q. Which of these five measures is most
11 reliable, in your view, in terms of assessing the
12 degree of winter habitat utilization by moose?

13 A. I would suggest that the data --
14 there are limits on all of them -- in the data
15 collection of all of them.

16 I think that utilization -- browse
17 utilization is perhaps the critical aspect in this
18 report in terms of presenting data relevant to how
19 moose have responded to the vegetative changes that
20 may -- on the site.

21 Q. Is this not the variable with the
22 greatest difference between the controlled and treated
23 sites?

24 A. I believe you're talking about apples
25 and oranges when you're saying -- comparing those. As

1 a factorial increase, I think that's -- the statement
2 you've made is correct, if you're referring to: This
3 factor was changed by the greatest extent but,
4 obviously, that isn't appropriate when you're comparing
5 number of tracks versus amount of moose browse
6 available. It certainly is --

7 Q. How would I compare the fact that
8 there's 12 times greater impact in terms of browse
9 utilization and a 4 times greater impact in terms of
10 available browse? How would I compare those apples and
11 oranges then?

12 A. With some difficulty. I was
13 referring more to the fact of making comparisons
14 between tracks and track areas and things like, you
15 know, browse available, browse utilized.

16 Q. Is it not the -- is not the sampling
17 approach used in this study much more intensive than
18 that used in the Newton study, Exhibit 722?

19 A. With respect to browse utilization,
20 of course the Newton study didn't look at that aspect
21 at all.

22 Q. That wasn't my question, Mr.
23 Kingsbury.

24 A. Okay.

25 Q. Is not the sampling --

1 A. I can't make a comparison when one
2 paper did it, one didn't. All right. Are you
3 referring --

4 Q. They both measured browse
5 availability, Mr. Kingsbury.

6 A. Yes.

7 Q. My question is: Is not the sampling
8 approach used in this study much more intensive than
9 was used in the Newton study?

10 MS. MURPHY: With respect to browse
11 availability?

12 MR. HANNA: Fine.

13 MS. MUPRHY: Well, it's your question.
14 He has to know what you're asking him.

15 MR. HANNA: Q. With respect to browse
16 availability.

17 MR. KINGSBURY: A. Are you talking about
18 number of data points collected or the methodology
19 employed?

20 Q. Number of data points, the
21 methodology, cut it any way you wish.

22 A. I'm not sure in terms of number of
23 data points that there's a great deal more data
24 collected, it's collected in a different fashion in
25 this study. I think they're both appropriate and it's

1 arguable as to which is more intensive.

2 Q. Do Connor and McMillan not use strict
3 quantitative estimates of browse rather than
4 qualitative eyeball measures that were used by Newton?

5 A. We've discussed that before and I do
6 not consider eyeball estimates not to be quantitative,
7 they are in fact quantitative.

8 Q. But these authors did go out and
9 actually collect material and go through a strict
10 estimate of the browse availability; did they not?

11 A. And I would suggest to you that
12 there's errors in those measurements just as there are
13 errors in visual estimates. I think both methods are
14 widely used and appropriate to estimating browse
15 availability.

16 Q. What experience do you have in using
17 either of those methods, Mr. Kingsbury?

18 A. My experience -- personal
19 experience--

20 Q. Yes.

21 A. --in that kind of data collection is
22 fairly limited. I've primarily been involved with
23 people who are gathering data on the efficacy for a
24 range of plant species which may have nothing to do
25 with browse availability and the measurements that they

1 employ in doing that.

2 Q. Do the --

3 A. Along the efficacy lines.

4 Q. Do the results of Connor, McMillan
5 compare with the work by Connor, 1986 and Kennedy, 1986
6 and 1985?

7 MS. MURPHY: He has not provided, as I
8 recall, any -- certainly not with Connor, '86.
9 Although he has discussed it, he hasn't provided that
10 and I'm not aware if the other documents have been
11 provided.

12 MR. HANNA: Mr. Chairman, these are
13 documents that are referred to in the exhibit that the
14 witness has come forward to speak to. I don't know
15 that I'm under obligation to provide him with the
16 articles that he's actually referencing.

17 MS. MURPHY: There are around 280
18 articles referenced in the ESSA Document and this
19 witness in no way has ever suggested he is familiar
20 with every word and syllable and sentence in those 280
21 references.

22 MR. HANNA: Mr. Chairman, who should I
23 ask these questions to in terms of the ESSA Document?
24 I want to talk about the ESSA Document.

25 MS. MURPHY: And by the way, it's not

1 referenced in the ESSA Document.

2 MR. HANNA: Mr. Chairman, it's referenced
3 in the ESSA Document on page 73.

4 MS. MURPHY: Connor, 1986?

5 MR. HANNA: No, Kennedy.

6 THE CHAIRMAN: Well, unless Mr. Kingsbury
7 has memory recall of that particular document
8 referenced in the ESSA exhibit, then he must at least
9 be allowed an opportunity to refresh his memory by
10 having the document in front of him and reviewing the
11 document so that he could answer your question, unless
12 of course --

13 MR. HANNA: So you're suggesting it's now
14 the obligation of parties --

15 THE CHAIRMAN: No, I'm suggesting, Mr.
16 Hanna, that we are dealing with a case that involves
17 literally hundreds, and I would suggest by the time it
18 is over, thousands of documents.

19 I'm suggesting it is not completely fair
20 to put a question to a witness on any of these
21 documents and expect him to immediately remember and
22 recall every word in every document.

23 What I am suggesting is, is that when a
24 question is put to the witness, unless he is prepared
25 to answer that question without having the document in

1 front of him, that he be allowed an opportunity to
2 refresh his memory in that fashion.

3 MR. HANNA: Perhaps Mr. --

4 THE CHAIRMAN: I am quite sure we could
5 put questions to you based on some earlier
6 documentation that you have referred to that you may
7 not recall either--

8 MR. HANNA: Mr. Chairman --

9 THE CHAIRMAN: --and would like an
10 opportunity to refresh your own memory.

11 MR. HANNA: Mr. Chairman, I am not coming
12 before this Board as an expert to provide evidence, and
13 if I was I would assure you that I would be available
14 to answer those questions.

15 THE CHAIRMAN: Well, I'm not saying the
16 witness is unavailable to answer the questions. What
17 we are saying here, Mr. Hanna, is that the witness must
18 be afforded an opportunity to refresh his memory in
19 these kinds of circumstances.

20 MR. HANNA: Thank you.

21 MR. KINGSBURY: Mr. Hanna, I would point
22 out that the Connor paper you indicated is not
23 referenced in the ESSA Document. Is that -- that's
24 correct?

25 MR. HANNA: That's correct, yes.

1 MR. KINGSBURY: Okay.

2 THE CHAIRMAN: Now, with respect to the
3 other paper he referred to --

4 MR. KINGSBURY: With respect to the
5 Kennedy paper, that's an M.Sc thesis that came out of
6 the University of Minnesota, I believe, in 1986. I'm
7 not familiar with the details and the methodology that
8 paper used, I have not seen the thesis.

9 MR. HANNA: Q. There's also a Kennedy
10 paper, 1985. You're not familiar with that one either?

11 MR. KINGSBURY: A. That's referenced?

12 Q. I'm talking about Kennedy and Jordan,
13 1985, Glyphosate and 2,4-D, The Impact of Two
14 Herbicides on Moose Browse and Forest Plantations,
15 Alces 21.

16 A. That's not in the ESSA Document and--

17 Q. You're not familiar?

18 A. --I'm not familiar with it, no.

19 MR. HANNA: Perhaps, Mr. Chairman, part
20 of my impatience here is I'm trying to move here along
21 as quickly as possible, but the progress is...

22 THE CHAIRMAN: Well, let's not talk about
23 patience at this point.

24 MR. HANNA: Yes, Mr. Chairman.

25 THE CHAIRMAN: In fact, I think we will

1 take a break. We will adjourn for 15 minutes.

2 Thank you.

3 ---Recess taken at 9:20 a.m.

4 ---On resuming at 9:40 a.m.

5 THE CHAIRMAN: Thank you. Be seated,
6 please.

7 Mr. Hanna?

8 MR. HANNA: Mr. Chairman.

9 Q. Mr. Kingsbury, can we turn to page 2
10 of Exhibit 771A, please. I'm looking at the first --

11 MS. MURPHY: I'm sorry. I'm just
12 suggesting that Dr. Ritter might, if that's
13 appropriate, just to sit at the back of the room for
14 the time being.

15 THE CHAIRMAN: Are you going to have any
16 questions for Dr. Ritter at this moment?

17 MR. HANNA: I can't anticipate any at
18 this time, Mr. Chairman, none whatsoever.

19 MS. MURPHY: Well then, perhaps that
20 would be appropriate. If he is required, he will be
21 here.

22 THE CHAIRMAN: Are we still on 771?

23 MR. HANNA: Yes, Mr. Chairman, 771A on
24 page 2.

25 THE CHAIRMAN: Page 2. Do you anticipate

1 finishing by ten?

2 MR. HANNA: Certainly not by ten, Mr.
3 Chairman. I don't think I started until twenty after
4 eight and the witness has been much longer than I
5 expected.

6 THE CHAIRMAN: Well, please adjust your
7 examination to finish by 10:30, no later.

8 MR. HANNA: Mr. Chairman, as I'm sure you
9 can appreciate, I have very little control over the
10 witness in terms of the length and nature of the
11 answers that he provides.

12 I have attempted in the cross-examination
13 I put together - and I can tell you I spent
14 considerable time in doing this - to stay within that
15 two-hour period.

16 THE CHAIRMAN: And we have made
17 scheduling arrangements based on your undertaking given
18 to us the last time and we, Mr. Hanna, are going to
19 stick to them and, therefore, you have until 10:30 to
20 complete your cross-examination.

21 MR. HANNA: Mr. Chairman, I object to
22 that ruling.

23 THE CHAIRMAN: Very well. You have
24 another forum to go to if you so object.

25 MR. HANNA: Thank you.

1 THE CHAIRMAN: Mr. Kingsbury, kindly keep
2 your answers as concise as possible and try and answer
3 the specific questions put to you by Mr. Hanna. To the
4 extent that you have to give a full answer and expand
5 upon your answer, you will be free to do so, but we are
6 trying to proceed as expeditiously as possible.

7 MR. KINGSBURY: I understand, Mr.
8 Chairman.

9 MR. HANNA: Q. Can we turn to page 2 of
10 771A, please, Mr. Kingsbury?

11 MR. KINGSBURY: A. Yes.

12 Q. Now, the first full paragraph there
13 is referring to the Kennedy and Jordan paper and the
14 Kennedy paper. Based on your reading of this, they
15 were both conducted in northern Minnesota?

16 A. Yes.

17 Q. So that's quite close to the area of
18 the undertaking?

19 A. Yes.

20 Q. Very similar type of habitat?

21 A. I don't know the specifics of their
22 study areas. It's the same forest region.

23 Q. Thank you. Based upon your reading
24 of that paragraph, does it not appear that their
25 results concur with the results reported in this

1 exhibit?

2 A. I don't believe there's specific
3 information in Exhibit 771A that deals with the grass
4 forb and raspberry component on these glyphosate
5 treated areas increasing after treatment. In terms of
6 reductions of browse availability, there appear to be
7 similarities.

8 Q. Can you look at the top of page 2
9 where it says -- starts, the first sentence there:

10 "Glyphosate is a systemic herbicide and
11 complete plant kill with little or no
12 resprouting as susceptible deciduous
13 shrubs and trees often occurs after
14 application."

15 And then it says:

16 "Moose managers are concerned that
17 glyphosate application will reduce
18 available browse and consequently moose
19 habitat quality."

20 Do you see that?

21 A. Yes.

22 Q. Are you concerned that glyphosate
23 will significantly reduce moose habitat quality?

24 A. On a specific site it will reduce
25 browse available. That's one parameter of moose

1 habitat which, in different situations, can be more or
2 less important. Of course you've got to put it in
3 perspective of overall habitat and the portion of areas
4 of habitat that are affected in the ways outlined.

5 THE CHAIRMAN: Mr. Kingsbury, unless the
6 Board is missing something, is it not the purpose of
7 some of these herbicides to kill vegetation?

8 MR. KINGSBURY: Yes.

9 THE CHAIRMAN: Is that not the purpose
10 for which they are used?

11 MR. KINGSBURY: Yes.

12 THE CHAIRMAN: Is it in any way
13 surprising that the use of this herbicide or other
14 herbicides would kill vegetation that certain animal
15 species would normally use for habitat?

16 MR. KINGSBURY: No.

17 MR. HANNA: Q. Is it your view, Mr.
18 Kingsbury, that they all respond in the exact same way?

19 MR. KINGSBURY: A. All animal species?

20 Q. No, all herbicides in terms of their
21 impact on wildlife through habitat effects?

22 A. Different herbicides cause different
23 changes in the vegetative communities which --

24 Q. Thank you. Can we turn to page 17,
25 please. Now, that first sentence, is it not fair to

1 conclude from that that the moose know more about
2 browse than the biologist out collecting the detailed
3 field measurements?

4 THE CHAIRMAN: Well, it is awfully hard
5 to speculate on what the moose knew over the biologist
6 in fairness, Mr. Hanna.

7 MR. HANNA: Q. Well, the moose preferred
8 the controlled areas; is that not what it says, despite
9 the expectation of the biologist that it be otherwise?

10 MR. KINGSBURY: A. I'm not aware of the
11 expectations of the biologist. The moose preferred
12 control areas based on pellet groups per hectare.

13 Q. Would you look at Table 7, page 18.
14 If you look at the ratio of available biomass to
15 utilized biomass in the controlled and treated, there's
16 almost a three-fold greater utilization in the control;
17 is that not correct?

18 A. In terms of the weight per hectare
19 utilized, yes.

20 Q. Do these results not directly
21 contradict those of Sullivan? Does this not suggest
22 that the moose are detecting a preference of browse --
23 glyphosate-treated browse before it's actually died
24 back?

25 A. No, Mr. Hanna, I wouldn't draw that

1 conclusion because, as you will see in Table 7, there
2 is more browse available on the control site than there
3 is on the treated site. It may suggest that the moose
4 are responding to the amount of browse available.

5 Q. Does this study not conclude that
6 moose are not that conscious of total browse
7 availability in terms of their actions?

8 A. This specific study here?

9 Q. This particular study, and I would
10 refer you particularly to the results in terms of the
11 track counts and track -- particularly track counts.

12 A. I don't believe that data is
13 appropriate to support the conclusion you've suggested.

14 Q. So you're suggesting that these
15 results do not show any preference by moose of the
16 controlled and treated sites in terms of browse
17 utilization at this period? This is -- I should make
18 it clear, this is nine months after the spray.

19 A. You've jumped around a little there.
20 Table 7 says the moose utilized the control sites to a
21 greater extent at that time, the time period nine
22 months post-spray.

23 It also says there was more browse
24 available on the control than treated. I disagreed
25 with your -- a different suggestion than I think what

1 you've referred to in this question.

2 Q. The proportion of the available
3 browse that was utilized, is it higher or lower in the
4 controlled site?

5 A. It's higher.

6 Q. In fact, 1.3 per cent of the total
7 available biomass was utilized, approximately?

8 A. No, 1.3 kilograms per hectare. It's
9 not a percentage of available biomass.

10 Q. Can you divide 1.295 by 100, please?

11 A. Okay. If you want to present that
12 data, you are saying that we would come up with 1.3 per
13 cent of the control -- available control utilized and
14 you would need to then come up with another figure for
15 treated which would -- perhaps you've done the --

16 Q. It would be about .5.

17 A. .5, okay.

18 Q. So there's about three times
19 difference?

20 A. Two to three, yes.

21 Q. So the browse -- the moose seem to be
22 making some differential selection between the
23 controlled and the treated nine months after spray?

24 A. This isn't a selection experiment as
25 I understand selection where they have comparable

1 opportunities to utilize two sites and make a selection
2 one for the other. I'm not sure the authors have
3 suggested that is the case from this study.

4 They're definitely utilizing -- there's
5 more browse on the control site and it's being utilized
6 more than on the treated site.

7 Q. Proportionately more also?

8 A. Yes.

9 THE CHAIRMAN: Mr. Kingsbury, in your
10 opinion, after reading this study, does it stand for
11 the proposition, in your view, that more browse on
12 untreated areas are utilized by moose as a result of
13 the fact that the untreated areas are not treated by
14 glyphosate?

15 MR. KINGSBURY: I think that's
16 appropriate, yes.

17 THE CHAIRMAN: And, therefore, the other
18 side of the coin is less browse is utilized by moose on
19 areas treated by glyphosate?

20 MR. KINGSBURY: Yes.

21 THE CHAIRMAN: Would that be in any way
22 an unusual inference to draw?

23 MR. KINGSBURY: No.

24 THE CHAIRMAN: Would you expect the same
25 type of thing to occur with the use of other chemicals

1 other than glyphosate?

2 MR. KINGSBURY: If they had the same
3 changes -- effect on vegetation, yes.

4 THE CHAIRMAN: Would you expect the other
5 chemicals to have the same types of changes on
6 vegetation?

7 MR. KINGSBURY: If they're effective for
8 the purposes used they would have somewhat similar, but
9 it would vary with species.

10 THE CHAIRMAN: And can you, from your
11 knowledge, make any statement concerning whether in
12 your opinion it would be better to utilize glyphosate
13 or other chemicals in order to enhance the management
14 of moose?

15 MR. KINGSBURY: I guess in terms --

16 THE CHAIRMAN: If you can't answer that
17 question then say so.

18 MR. KINGSBURY: I can't really answer it
19 on the basis of direct experience where we're seeking
20 to actually produce moose browse, that's usually the
21 opposite purpose to what's happening with these uses
22 where we're trying to reduce competition for crop
23 trees.

24 MR. HANNA: Q. Can we turn to page 19,
25 please, on 771A. We've dealt with this matter that

1 there was not statistically significant differences
2 between the controlled and treated areas as reported in
3 Table A -- Table 8, excuse me.

4 MR. KINGSBURY: A. Yes.

5 Q. Now, you read this into the record.
6 You didn't read the following sentence, which is:

7 "The lack of significance at this time
8 was probably due to the experimental
9 design and not due to the lack of real
10 differences."

11 They go on to explain why, in their view,
12 they did not get statistically significant results and
13 indeed they go on to say that:

14 "Even with such a conservative test the
15 amount of browse utilized was nearly
16 significant at the 95 per cent confidence
17 interval."

18 I think the number there suggests that if
19 it had been around 92 or three per cent it would have
20 been significant; is that correct?

21 A. That's what the authors say, yes.

22 Q. So would you not agree with me that
23 the authors are certainly of the view that the lack of
24 significance is in fact an aberration of the experiment
25 and not of any real effects -- the lack of real

1 effects?

2 MS. CRONK: I'm sorry, sir, the witness
3 can't answer the question as to the views of the
4 authors. He can comment on what his views are based on
5 the paper.

6 MR. HANNA: Thank you, Ms. Cronk.

7 Q. What are your views on that, Mr.
8 Kingsbury?

9 MR. KINGSBURY: A. I recognize the very,
10 very significant difficulties in establishing
11 statistically significant changes in the types of
12 parameters that we're being asked to look at in this
13 paper.

14 One of the problems of course is that the
15 available browse is only one of a great number of
16 variables that may be in fact at play in affecting the
17 numbers -- the data that is collected, okay.

18 Q. But, Mr. Kingsbury, this is not
19 dealing with browse available only, it's talking about
20 browse utilization and pellet groups. Table 8 refers
21 to all three; does it not?

22 A. Okay. Well, in all aspects of the
23 data being collected in this study I recognize from my
24 personal experience with this kind of study the
25 difficulties that the authors have in demonstrating

1 statistically significant differences between the
2 treated and control area.

3 That's one of the realities, that it
4 simply reflects the fact that biological systems are
5 very complex and even -- although you've suggested the
6 methodology in this paper is state-of-the-art and I
7 would tend to agree with that, even that methodology is
8 incapable of looking at a very, very fine level.

9 I would suggest that's not necessary in
10 order to get useful data out of it, but to suggest that
11 it's an aberration of this study that they didn't show
12 a statistically significant effect, I disagree with.

13 Q. Do you feel that this is useful data
14 upon which to make management decisions?

15 A. Yes.

16 Q. You did not have the advantage of the
17 Connor and McMillan study when you arrived at the
18 conclusions in the ESSA Document and in your witness
19 statement; is that correct?

20 A. Yes, we had -- the interim report was
21 known to -- and I believe the study was fairly well
22 known to some of the people involved in the ESSA
23 process.

24 Q. So you did have it available to you?

25 A. I say I believe that -- well, I know

1 of the existence of this study, okay.

2 Q. Well, let's just deal with your
3 witness statement.

4 A. We're going to go backwards here, Mr.
5 Hanna. I did not take part in the ESSA process--

6 Q. I'm talking about your witness
7 statement.

8 A. --and the workshop.

9 Q. I'm not talking about the ESSA
10 Document, I'm talking about your witness statement, the
11 witness statement that you signed.

12 A. Yes.

13 Q. Did you have the advantage of the
14 Connor and Gratz conclusions when you arrived at your
15 conclusions in your witness statement?

16 MS. MURPHY: I think we can shorten this
17 up. This particular paper was not written at the time
18 the ESSA project was done and, therefore, it is
19 certainly not cited in that document, and that the
20 material -- the interim report was written up
21 subsequently and, again, the witness is just indicating
22 that some of the people who were at the ESSA project
23 knew that this project here was ongoing, and I think
24 that's all he's attempting to indicate.

25 But my friend is right, it's not cited in

1 the ESSA Document.

2 MR. HANNA: Q. I was referring to your
3 witness statement, Mr. Kingsbury.

4 MR. KINGSBURY: A. I agree with
5 everything Ms. Murphy said, and the fact is that having
6 not been in my position over the last year --

7 THE CHAIRMAN: Okay. Mr. Hanna, refer
8 him to the areas in the witness statement that you want
9 him to comment on.

10 MR. HANNA: Q. It would be at page 76,
11 paragraph 38.

12 MR. KINGSBURY: A. I think I've lost
13 that, if I can have some assistance.

14 MS. BLASTORAH: (handed)

15 MR. KINGSBURY: Yes. That, the statement
16 that you've pointed out is, in my opinion, fully
17 compatible with the data that is presented in Exhibit
18 771A.

19 MR. HANNA: Q. On page 21 - again, we
20 have touched on this briefly - this is on 771 -- excuse
21 me, 771A. I am dealing with this last paragraph
22 starting with:

23 "Subsequently..."

24 Would you agree that --

25 A. Sorry, the sentence starting with

1 "subsequently" in the paragraph:

2 "The track aggregate data..."

3 That is the last paragraph on 21 that I
4 have.

5 Q. Okay. I wasn't sure whether
6 subsequently was a new paragraph or not, but I'm--

7 A. Well, okay. You've got --

8 Q. --only here dealing with:

9 "Subsequently, net energy returns on the
10 treated areas..."

11 A. Yes.

12 Q. Is it your view that by increasing
13 energy demand to obtain adequate food intake that the
14 productivity of wildlife populations can be
15 significantly reduced?

16 A. May be significantly reduced
17 depending on the magnitude of the energy demands and
18 energy requirements.

19 Q. Is it also your view that the
20 population becomes more susceptible to other types of
21 stresses such as disease, periodic severe weather
22 conditions, predation, et cetera?

23 A. Certainly, and maybe more susceptible
24 to extremes in things like weather, yes.

25 Q. We have talked about the last

1 sentence in that paragraph starting with:

2 "This may be particularly important to
3 that component of population."

4 A. Yes, we have talked about it. What
5 is your question?

6 Q. Would you agree that the potential
7 exists for the effects on a relatively small contingent
8 of the population to be considerably magnified in terms
9 of the population as a whole?

10 A. Repeat the question, please?

11 Q. Is it your opinion that the potential
12 exists for the effects on a relatively small contingent
13 of the population, in this case cows with calves, to be
14 considerably magnified in terms of population-wide
15 consequences?

16 A. I am sorry, Mr. Hanna, I am having
17 difficulty with the question.

18 Q. Let me give you an example. Is this
19 not the basis for the selective harvest system in
20 Ontario?

21 THE CHAIRMAN: Well, what has this got to
22 do with the effect from herbicides?

23 MR. HANNA: Very much, Mr. Chairman. I
24 believe this statement is suggesting that the
25 herbicides may differentially affect the moose

1 population and may affect that portion of the
2 population that might be most important in terms of
3 overall health in the population, that is cows with
4 calves, and I am trying to confirm that with this
5 witness.

6 MR. KINGSBURY: What you are saying to me
7 is that if impacts in moose populations occur -- are
8 restricted to cows with calves, that may still mean
9 that they could have significant ramifications for the
10 moose population because that is the productive
11 component. Yes, I agree.

12 MR. HANNA: Q. Are you aware of
13 predictive tools developed by biologists to analyse the
14 consequences of changes in feeding/energy demand?

15 MR. KINGBURY: A. Generally.

16 Q. Have you ever used these tools?

17 THE CHAIRMAN: Well, are you talking with
18 respect to the management of wildlife species?

19 MR. HANNA: In whatever protectional
20 context Mr. Kingsbury would wish to refer.

21 THE CHAIRMAN: Well, the context I would
22 suggest that he would refer to would be to do with
23 plant ecologies and things like that, not wildlife.

24 MR. HANNA: I'm sorry, I don't follow,
25 Mr. Chairman. I thought this witness was coming

1 forward and speaking on impacts of herbicides and --
2 well, pesticides in general, herbicides in particular
3 on terrestrial and aquatic organisms.

4 THE CHAIRMAN: Well, okay. Perhaps I
5 have lost you. Put your question.

6 MS. MURPHY: Perhaps it might help us all
7 if we back up to the last question.

8 The last question, as I understood it,
9 was: Are you aware of predictive tools that do
10 something, and the witness said generally. If we can
11 have some idea of what predictive tools these two
12 gentlemen are talking about it might help us all to
13 understand what the next question is.

14 THE CHAIRMAN: I thought he was getting
15 at predictive tools concerning the management of
16 wildlife and I --

17 MS. MURPHY: That is the problem, I
18 think.

19 THE CHAIRMAN: I am suggesting that this
20 witness may be familiar with predictive tools with
21 respect to the management or life cycles of plant
22 systems, but not necessarily wildlife.

23 So what is your exact question, Mr.
24 Hanna?

25 MR. HANNA: Q. Have you ever used the

1 type of predictive tools you said you are generally
2 aware of to analyse the consequences of changes in
3 feeding/energy demand on moose populations?

4 MR. KINGSBURY: A. No.

5 Q. On any wildlife population?

6 A. The closest we have come is looked at
7 consequences of stream invertebrate reductions to trout
8 growth. We have not done it on a caloric level.

9 Q. In the interest of time I am going to
10 try and truncate this. What stand or forest level
11 analysis have you undertaken to arrive at your
12 conclusions in the witness statement regarding the
13 impacts of glyphosate on moose habitat or moose
14 populations?

15 A. I guess the closest answer I can give
16 is that in the statement there it refers to changes in
17 the structural habitat take place on a local scale for
18 periods of a few years and that would be the -- those
19 would be taken into consideration in making that
20 conclusion.

21 Q. So are you saying you did do stand
22 and forest level analysis to arrive at those
23 conclusions?

24 A. In a conceptual sense, yes.

25 Q. Are you familiar with the paper Mr.

1 Buss included in his witness statement for this
2 panel -- it's actually the combined panel, it was Panel
3 12?

4 A. Refer me to it, please.

5 Q. It's an article by Brunnell and
6 Eastman which refers to a predictive model to evaluate
7 the population impacts of various forestry practices?

8 A. I'm not intimately acquainted with
9 it, I would have to see it.

10 Q. You have never -- didn't use that in
11 any of your conclusions?

12 A. No.

13 Q. And you didn't attempt to use it in
14 any of your conclusions?

15 THE CHAIRMAN: Well, he didn't use it in
16 any of his conclusions. He either used it or he didn't
17 use. It's hard to attempt to use it or not use it if
18 you didn't use it.

19 MR. HANNA: Q. This is the last topic I
20 want to deal with you, Mr. Kingsbury. Can we look at
21 Exhibit 310, please.

22 MR. KINGSBURY: A. The Guidelines for
23 Provision of Moose Habitat?

24 Q. Yes.

25 A. Is that 310 or 304, Mr. Hanna? I may

1 have marked it wrong. 310. Thank you.

2 Q. Can we turn to page 5, please?

3 A. Yes.

4 Q. In the right-hand column there
5 towards the top it deals with chemical site
6 preparation--

7 A. Yes.

8 Q. --and the impacts of that. Now, the
9 paragraph that starts with:

10 "The effect of chemical site preparation
11 depends largely on the chemical being
12 used."

13 A. Yes.

14 Q. Do you concur with that?

15 A. Yes.

16 Q. And the last sentence there makes
17 specific reference to glyphosate; does it not?

18 A. Yes, it does.

19 Q. Is it not your reading of that
20 sentence that these authors at least are of the view
21 that glyphosate has the potential of having quite
22 different and quite -- and much more substantial
23 impacts than 2,4-D?

24 A. They are suggesting that it would be
25 more effective in killing a variety of plants. The

1 statement there that says that:

2 "It may substantially reduce browse
3 species for an extended period."

4 I think reflects back to the speculation
5 that is contained in the Kennedy thesis, we referred to
6 that before, it's on -- made reference to in page 73 of
7 the ESSA Document where Kennedy collected data, I am
8 not sure for how many years, but he speculated that
9 amounts of browse production would remain low for five
10 to ten years.

11 Q. So these authors also have
12 speculated, based upon their expert opinion, have come
13 to a similar conclusion or even -- it's not clear
14 whether extended period is 10 years or more.

15 A. I would suggest that these authors
16 are probably drawing on that same speculation.

17 Q. You are speculating on that?

18 A. My speculation would be fairly firm
19 simply because, as you have already pointed out, there
20 is very limited data available as to long-term
21 responses of vegetation to glyphosate. We haven't used
22 it long enough. One of the first pieces of data that
23 is available, which is in the Newton paper, would in
24 fact not support the speculation, it contradicts it
25 with data.

1 Q. So you are saying that the extended
2 period here is different than the few years that you
3 have used in your witness statement and that you
4 disagree with this extended period speculation that
5 these authors have come to?

6 A. I am saying that now that there is
7 some data available some seven years after glyphosate
8 treatment it does not suggest this conclusion.

9 Perhaps -- and I would certainly agree
10 that, you know, more data needs to come in and will
11 come in as we get further into the use pattern of
12 glyphosate.

13 Q. Well, the authors here make a
14 specific reference to the beneficial -- potentially
15 beneficial effects of 2,4-D. They don't, however, make
16 any reference to potential beneficial effects of
17 glyphosate; do they?

18 A. No, they do not. I guess --

19 Q. They potentially just overlook the
20 fact that glyphosate may have beneficial effects.

21 MS. CRONK: With respect to browse?

22 MR. HANNA: Thank you, Ms. Cronk.

23 Q. Yes, with respect to browse.

24 MR. KINGSBURY: A. They say 2,4-D can
25 encourage root suckering. We would take that to

1 suggest they have included some consideration of
2 beneficial effects.

3 I think they certainly haven't talked
4 about glyphosate in terms of beneficial effects such as
5 may be suggested in the Newton paper that shows that
6 seven years after glyphosate use there was a lot more
7 browse on that site than on untreated sites, in fact it
8 was comparable to on sites that had been treated with
9 phenoxys. That could be considered a beneficial effect
10 in the context that you have used this question.

11 Q. Can we turn to page 31, please.

12 A. Yes.

13 Q. The section there that deals with
14 herbicides.

15 A. Yes.

16 Q. This paper has similarities to the
17 ESSA Report in terms of the articles referenced and
18 some of the conclusions reached; would you agree?

19 A. It tends to draw on the same body of
20 data, yes.

21 Q. And this study was prepared in 198 --
22 or this report or paper was prepared in 1981; is that
23 correct?

24 A. The Timber Management Guidelines?

25 Q. No. This is actually -- perhaps I

1 should have helped you here, Mr. Kingsbury.

2 A. Oh, I see.

3 Q. This is an excerpt from -- this is
4 actually an extracted paper from the Boreal Mixed Woods
5 Symposium which I believe was published in 1981.

6 A. Okay. I don't see a date. This
7 symposium I believe was held in 1981.

8 Q. The date in the ESSA Report is 1984
9 but I believe that is incorrect.

10 A. I think this -- probably the
11 symposium was held in '81 and the proceedings may have
12 been published in '84.

13 Q. Well, I think the important thing is
14 the time when the paper was prepared. It was prepared
15 in 1981, that is to the best of your knowledge?

16 A. Okay. I don't really have knowledge
17 of that because I can't find a date on the paper. I
18 will take your word for it.

19 Q. I have the original document here and
20 I can produce it to you.

21 A. Okay.

22 Q. All of the studies referred to in
23 this section under herbicides refer to phenoxy
24 herbicides and not to glyphosate; is that correct?

25 A. I believe that's correct.

1 Q. Now, I would like to look at this
2 last paragraph under herbicides on page 31 at the top:

3 "The discussion thus far is centered..."

4 A. Yes.

5 Q. And they talk about, if you will, a
6 less common potentially evolving use of herbicides. Is
7 that the way you read that?

8 A. I don't see the word evolving. It
9 says a less common use is for stand conversion.

10 Q. Now, this completely sterilized
11 reference --

12 THE CHAIRMAN: What is a sterilized
13 reference?

14 MR. HANNA: Sorry. It's in that
15 paragraph, Mr. Chairman. It's the second sentence
16 that -- looks like:

17 "A less common use of herbicides is for
18 stand conversion where all deciduous
19 competition in mixed wood stands is
20 killed through repeated application of
21 herbicides or where mixed wood cut-over
22 sites are completely sterilized with
23 herbicides."

24 Q. Do you see that reference?

25 MR. KINGSBURY: A. I see the reference,

1 yes.

2 Q. Would glyphosate be the herbicide of
3 choice to sterilize a site?

4 A. I am not aware that sterilization of
5 sites is really either a reality or practice.

6 Q. So these are rather unrealistic
7 authors?

8 A. Sterilization is --

9 MS. MURPHY: In fairness to the authors,
10 they did put the word in what Mr. Osborn would call
11 speech marks.

12 MR. KINGSBURY: I guess they are
13 suggesting that it is possible, with repeated use of --
14 repeated applications of herbicides to attempt to
15 eliminate plant growth for quite a while.

16 That has been attempted in places like
17 the Hubbard Brook experiment, which I am sure has been
18 before us many times, and I think that suggests how
19 difficult it is to do it.

20 MS. MURPHY: I think -- I was going to
21 point out that in fact there has been evidence about
22 the Hubbard Brook experiment where one of the things
23 they attempted to do was remove as much as possible of
24 the vegetation.

25 And the evidence before you, Mr.

1 Chairman, is that in that case they chose an entirely
2 different product, in fact one that isn't registered
3 for forestry use in Ontario at all, because that is
4 what they were looking to do.

5 MR. KINGSBURY: I might suggest that if
6 one wanted to sterilize a site there are combinations
7 and products of herbicides such as those that people
8 put on their driveways, et cetera, that are designed
9 for those purposes.

10 They generally ---they almost invariably,
11 I would suggest, require high application of a mixture
12 of herbicides simply because one herbicide in itself is
13 not likely to affect all plant species or groups of
14 plant species enough to eliminate them all.

15 THE CHAIRMAN: Well, is the fact simply,
16 in your experience in Ontario, are herbicides that are
17 used in Ontario used for the purpose of sterilizing
18 areas?

19 MR. KINGSBURY: No.

20 THE CHAIRMAN: Do you expect them to be
21 used for that purpose in future?

22 MR. KINGSBURY: Not as a routine
23 operational thing, no.

24 MR. HANNA: Q. Can you turn to page
25 21452 of the transcripts.

1 MS. MURPHY: Which Volume is that?

2 MR. HANNA: 126.

3 MR. KINGSBURY: Yes.

4 MR. HANNA: Q. Now, are you not

5 indicating here that -- perhaps I should read it:

6 "As a for instance, if I might suggest,
7 glyphosate could be used in site
8 preparation situations where, because
9 2,4-D has to be basically applied to
10 actively growing foliage, glyphosate
11 could be applied to a situation prior to
12 any growth occurring and that that
13 immediate impact might in fact be that if
14 2,4-D was applied to a site..."

15 Da da da da. I don't need to read the
16 rest. I think the point is that this particular
17 example is talking about glyphosate being applied to a
18 cut-over site before deciduous vegetation has started
19 to grow.

20 MR. KINGSBURY: A. Because of the mode
21 of action of the material it can still be effective for
22 the purposes.

23 Q. And so that it has the potential of
24 restricting deciduous growth even before it starts; in
25 other words, to be able to maintain that site in a

1 controlled way, whereas 2,4-D does not have that
2 potential?

3 A. It has the potential to control
4 vegetation without having to be applied to actively
5 growing vegetation.

6 Q. And back to this article that we were
7 referring to on page 31. Glyphosate was not approved
8 for that sort of application at that time?

9 A. Glyphosate was not available for site
10 preparation treatments.

11 Q. Yes.

12 A. While the registration was at the
13 point of being registered, it hadn't been used.

14 Q. So that the type of concern they have
15 here in terms of mixed wood manipulations would be
16 enhanced with the availability of glyphosate to be used
17 on an operational level?

18 A. The ability to carry out stand --

19 Q. Conversion and the type of
20 manipulation referred to here?

21 A. Perhaps if I can suggest that with
22 having glyphosate available it's possible to act to
23 modify the vegetation on a site earlier in the
24 development of vegetation than it might be with
25 phenoxys.

1 Q. But you would agree that mixed wood
2 sites are often the most -- are the most often
3 considered for herbicide application because it is on
4 these sites where deciduous competition is the
5 greatest?

6 A. If you talk about the vegetation on
7 the site after harvest, of course it's basically a
8 mixed wood site. That may not necessarily mean that a
9 site that was a fairly solid conifer stand may not have
10 been converted more or less, if you want to call it
11 that, to a site that has quite a mixed wood nature
12 simply because of the harvesting practices.

13 Q. Are not mixed wood sites also sites
14 particularly of importance to moose in terms of habitat
15 quality?

16 A. Sometimes -- certain times of the
17 year certain mixed wood sites are rather critical, yes.

18 Q. Now, on Exhibit 604C on page 11 you
19 make reference to the 35 per cent of the harvested area
20 being treated with herbicide.

21 A. Yes.

22 Q. Do you recall that?

23 A. Yes.

24 Q. I am going to read you a statement, I
25 want to see if you agree with it:

1 "Using data from the Ontario Ministry of
2 Natural Resources and assuming that
3 approximately one third each of the
4 poplar..."

5 THE CHAIRMAN: What are you reading from?

6 MR. HANNA: It's a paper by Mr. Armson
7 called The Boreal Mixed Wood Forests of Ontario, Past,
8 Present and Future, 1988.

9 MS. MURPHY: Can the witness have a look
10 at it, please.

11 THE CHAIRMAN: Well, let him read the
12 question and see if he can answer the question. If you
13 need to consider the question, Mr. Kingsbury, in the
14 context of the paper, then we will give you an
15 opportunity to do so.

16 MR. HANNA: Q. "Using data from the
17 Ontario Ministry of Natural Resources and
18 assuming that approximately one third
19 each of the poplar, white birch and
20 spruce working groups represent mixed
21 woods, there appear to be about 18 per
22 cent in mixed wood forests in the
23 province."

24 Would you agree with that?

25 MR. KINGSBURY: A. It's really not an

1 area that I would suggest I am an expert.

2 Q. So you have no idea?

3 A. I will agree with Mr. Armson, I would
4 bow to his abilities as a forester to talk about
5 portion of mixed woods in the province.

6 Q. Does it not follow that if the
7 proportion of the mixed wood sites treated with
8 herbicides is proportionately greater than for other
9 sites, for example lowland spruce sites, bog sites, or
10 outwash jack pine stands, that the actual portion of
11 the mixed wood stands treated will be higher than 35
12 per cent?

13 MS. MURPHY: If the proportion is
14 generally higher than the average, then the proportion
15 will be higher than the average?

16 MR. HANNA: Correct.

17 MS. MURPHY: Assuming the proportion is
18 higher than the average, will the proportion be higher
19 than the average?

20 MR. KINGSBURY: Maybe if we can get to
21 the bottom line of this, Mr. Hanna, I don't think we
22 are going to get very far asking me to talk about
23 portions of forest types in the province.

24 MR. HANNA: Q. Well, it's only that your
25 conclusions, Mr. Kingsbury, in your words, conceptually

1 considered forest and stand level impacts.

2 MR. KINGSBURY: A. Yes.

3 Q. I am now talking about forest and
4 stand level impacts and I am asking you: In arriving
5 at your decision, conceptually or however else you did
6 it, what consideration you gave the mixed wood stands
7 and the proportion of those to be treated with
8 herbicides?

9 A. I would say the same kind of
10 considerations as you might see reflected in the
11 examples that are presented in the Moose Habitat
12 Guidelines where they look at actual sites, look at the
13 critical aspects on those sites for moose habitat
14 availability and then make some decisions in that case
15 relative to harvesting practices.

16 I am suggesting you can do the same kind
17 of things with the knowledge we have about herbicide
18 impacts and relate it to...

19 Q. You know --

20 THE CHAIRMAN: Let him finish please, Mr.
21 Hanna.

22 MR. KINGSBURY: And make the same kind of
23 decisions and conclusions such as I have regarding
24 herbicide.

25 MR. HANNA: Q. In arriving at your

1 conclusions, what did you assume in terms of the
2 proportion of the mixed wood sites harvested annually
3 that would be treated with herbicides?

4 MR. KINGSBURY: A. Mr. Hanna, to do that
5 on a province-wide basis would probably have the
6 potential of underestimating the changes that might
7 occur that might be of importance to moose in a given
8 area.

9 Q. Well, that is very nice, but could
10 you answer my question?

11 THE CHAIRMAN: He's attempting to.

12 MR. KINGSBURY: I am suggesting that, you
13 know, regardless of the fact, that if only 1/100th of 1
14 per cent of the province was treated, if it all
15 happened in one place in a certain fashion, then one
16 could have a significant change in moose habitat
17 because of the herbicide application.

18 So I guess what I am trying to suggest is
19 that it's more important rather than saying that we are
20 making changes in the whole province.

21 I think you will find - and I am sure you
22 would agree - that moose habitat in this province,
23 since the time that we have gotten into wild fire
24 suppression, has primarily been modified by forest
25 harvesting and it is within the context of the fact

1 that: One, forest harvesting is the prime way in which
2 we have modified the moose habitat; secondly, the
3 recognition that that can be positive or negative,
4 depending how you do it; thirdly, that herbicide
5 applications always almost inevitably follow harvesting
6 on a site, they are acting on sites that have already
7 been modified by the harvesting practices and they
8 can -- you know, to a certain extent we can predict the
9 changes in vegetation that will follow them, that it is
10 quite feasible to take those factors into consideration
11 to make a statement such as I have made saying that we
12 can limit the effects on moose populations that might
13 result from the changes in vegetation because of the
14 herbicide uses that we envisage.

15 MR. HANNA: Q. What proportion of the
16 mixed wood stands in the province did you assume would
17 be treated with herbicides in arriving at your
18 conclusions?

19 THE CHAIRMAN: Did you have any
20 proportion in mind, Mr. Kingsbury, at the time you made
21 your statements?

22 MR. KINGSBURY: I have a conceptual idea
23 of the nature of herbicide utilization in this
24 province, yes. I think that my picture --

25 THE CHAIRMAN: I think Mr. Hanna is

1 looking for a figure. Did you have a percentage figure
2 in mind with respect to herbicide use on mixed wood
3 stands throughout the province?

4 MR. KINGSBURY: Each year in this
5 province, as you may well know, Mr. Hanna, that it's
6 substantially less than 5 per cent, okay, of this
7 province -- of the mixed woods in this province that
8 are treated with herbicide each year.

9 MR. HANNA: Q. Of the mixed wood sites
10 that are harvested each year, less than 5 per cent are
11 treated with herbicides?

12 MR. KINGSBURY: A. I'm not talking about
13 harvested sites, I'm talking about the sites.

14 Q. I'm talking about harvested sites.

15 A. Harvested sites.

16 Q. I believe I was very clear about
17 that.

18 A. Okay. I would like to go to actual
19 figures. You want a figure, I want a -- first of all,
20 I don't have available to me the figure for mixed wood
21 sites that are harvested each year.

22 THE CHAIRMAN: So that's your answer, you
23 don't have a figure for that.

24 MR. KINGSBURY: Yes.

25 MR. HANNA: Q. So you didn't take into

1 consideration this in any --

2 THE CHAIRMAN: He just said he doesn't
3 have a figure.

4 MR. HANNA: That's fine.

5 THE CHAIRMAN: Well, he can't take it
6 into consideration presumably if he doesn't have a
7 figure.

8 MR. HANNA: Thank you, Mr. Chairman.

9 Q. Is it not true that mixed wood stands
10 are those most eligible for stand conversion?

11 MR. KINGSBURY: A. Certainly they're the
12 only types of stands you'd probably want to convert.

13 Q. And, therefore, these stands are also
14 most likely to receive repeat treatments of herbicides;
15 is that correct?

16 A. In theory, yes, they would be. In
17 practice, I've already suggested the type of stand
18 conversion that's been discussed that I believe you're
19 making reference to certainly isn't the common
20 practice.

21 Q. Are you aware of the general concern
22 among foresters and wildlife biologists concerning
23 appropriate management strategies for mixed wood sites
24 and, in particular, balancing timber and non-timber
25 values?

1 A. Certainly.

2 MS. MURPHY: He's going to have to give
3 him something more specific than that, Mr. Chairman.

4 THE CHAIRMAN: Are you going to refer him
5 to something specifically, Mr. Hanna?

6 MR. HANNA: Well, it's a statement
7 verbatim from Mr. Armson, but if he can't relate to
8 that, that's fine, Mr. Chairman.

9 THE CHAIRMAN: Well, he has indicated he
10 is not familiar precisely with that report, so...

11 MR. HANNA: Thank you, Mr. Chairman. I
12 am finished and I appreciate your patience.

13 THE CHAIRMAN: Thank you.

14 Are you ready, Ms. Kleer?

15 MS. KLEER: Can I have a moment to set
16 up, about five minutes?

17 THE CHAIRMAN: Okay. We will adjourn for
18 ten minutes.

19 MS. CRONK: I'm sorry, Mr. Chairman, I
20 wonder if I might address you just for a moment before
21 you rise.

22 THE CHAIRMAN: Yes.

23 MS. CRONK: Mr. Chairman, I rise simply
24 to address the Board very briefly on the ruling that
25 the Board has made concerning the time available to Mr.

1 Hanna to complete his cross-examination, and I do so in
2 an effort to be of assistance to the Board and to other
3 counsel.

4 I do not know if Mr. Hanna completed all
5 of those areas that he wished to cover in
6 cross-examination. If there were those, if there were
7 some remaining, it may be that he did. If there were
8 some remaining areas that he expected would take a
9 short time, I would just raise with the Board perhaps
10 the merits of canvassing that with him so that it's
11 clear that he covered what he intended to cover.

12 The Chairman will, of course, appreciate
13 my concerns, and my remarks are made in a genuine
14 effort to assist the Board and with the utmost of
15 respect, but I am concerned if there were one or two
16 areas that Mr. Hanna didn't cover that he be provided
17 an opportunity to do that.

18 And I am very conscious, sir, of the need
19 to move forward quickly and expeditiously at the
20 hearing but, nonetheless, I feel an obligation to rise.

21 MS. MURPHY: If I might, Mr. Chairman, I
22 understand that that consideration took place with some
23 factual information in your mind about some discussions
24 that took place earlier with respect to the amount of
25 time people would need for their cross-examination and

1 I don't entirely know what you had in mind for
2 re-examination.

3 I don't know if this will help, because I
4 don't think you will have had necessarily -- well, you
5 certainly didn't have my submissions with respect to
6 that - I don't know if this will help, but I can advise
7 that if we start my re-examination at about eight
8 o'clock tomorrow morning I think we can finish -- well,
9 we can finish by the time that you were concerned to
10 finish by, 11:45.

11 So I thought at this point it might be
12 wise to give you that further information, sir.

13 THE CHAIRMAN: Mr. Hanna, what haven't
14 you covered with this witness that you want to cover?

15 MR. HANNA: Well, Mr. Chairman, as a
16 result of your directions I have eliminated a whole
17 series of questions periodically throughout my
18 cross-examination.

19 To go back and deal with those would mean
20 to go back and to reopen those issues and to follow
21 through with those points that I wish to follow
22 through.

23 If you wish, I can take ten minutes and
24 give you a full compendium, but there's a number of
25 lines of the cross-examination that I truncated.

1 MS. CRONK: I wonder if Mr. Hanna is in a
2 position, Mr. Chairman, to advise the Board for its
3 assistance as to the time estimate he might think
4 likely were he to pursue those additional matters.

5 I don't mean to be presumptuous, sir, I
6 am just raising the issue to assist.

7 THE CHAIRMAN: Well, we had a time
8 estimate, Ms. Cronk, last time Mr. Hanna was here. The
9 time estimate at that time was that he would definitely
10 take no longer than two hours, as I recall. On that
11 basis we adjourned at a particular time last time
12 around.

13 We have rescheduled, as a result of Dr.
14 Ritter's availability and Mr. Kingsbury's availability,
15 other counsel to examine today. We have estimates from
16 Ms. Kleeer that she will take a certain amount of time
17 with these witnesses as well and we are basing our
18 scheduling for this hearing on that.

19 MS. CRONK: I too recall that estimate
20 and that is precisely the estimate that was given, and
21 I am very conscious, sir, of the scheduling
22 arrangements that were made in reliance on that
23 estimate and my remarks are not to be interpreted as
24 applying to that at all.

25 Could I make this suggestion, if the

1 Board is prepared to permit us to do this, that if you
2 were to rise now, which you were intending to do in any
3 event, perhaps counsel could address this matter and
4 speak to Mr. Hanna and it may be that there is some
5 further submission that we will wish to make to you.

6 THE CHAIRMAN: Very well. We will be
7 back in ten minutes. Thank you.

8 ---Recess taken at 10:37 a.m.

9 ---On resuming at 11:05 a.m.

10 THE CHAIRMAN: Thank you. Be seated,
11 please.

12 MS. KLEER: Good morning, Board.

13 MS. CRONK: Mr. Chairman, over the break
14 counsel got together with Mr. Hanna to discuss this
15 matter and we have a suggestion for the Board's
16 consideration.

17 All counsel are agreed, subject of course
18 to the Board's views on the matter, that if Ms. Kleer
19 were to proceed now with her cross-examination and
20 proceed to complete it, that would afford Mr. Hanna the
21 period of several hours to consider, in light of what
22 he did accomplish this morning, whether there was any
23 other matters that we wished to pursue and, were that
24 the case, and were the Board inclined to view this as
25 appropriate, we could then sit a little later this

1 evening to allow Mr. Hanna to pursue those areas within
2 whatever reasonable time frame the Board felt was
3 appropriate.

4 I have spoken to Mr. Hanna about that, as
5 have the other lawyers in the room, explained that we,
6 for our part, are willing to propose that to you.

7 I understand that he may not wish to
8 avail himself of that opportunity but, in our
9 collective submission to you, we respectfully urge you
10 to make that opportunity available to him.

11 Thank you, sir.

12 THE CHAIRMAN: Thank you. Well, ladies
13 and gentlemen, obviously the Board gave consideration
14 to its earlier ruling during the last recess and we
15 have taken the position, we feel throughout this
16 hearing, to afford all of the parties a reasonable
17 opportunity to present -- on the proponent's side to
18 present their evidence, on the part of all other
19 parties to cross-examine.

20 We have endeavoured throughout this
21 hearing to ensure that both the direct evidence is
22 relevant and to the point and that the
23 cross-examinations are similarly relevant,
24 non-repetitious and to the point.

25 We have also endeavoured, in the interest

1 of scheduling a very complex proceeding which involves
2 a number of parties and a number of witnesses, to have
3 some sense of when we can expect to hear from
4 particular parties and when we might expect to complete
5 or proceed to subsequent panels.

6 Now, we have attempted to solicit the
7 estimates from various counsels and parties represented
8 by others as to how much time they are going to take in
9 terms of their cross-examinations. We fully realize
10 that these estimates cannot always be precise, and I
11 think the record will show that the Board has bent over
12 backwards since the commencement of the hearing to
13 afford all of the parties a reasonable opportunity to
14 present their client's interests before this Board.

15 Now, that doesn't mean to say, in the
16 Board's view, that the presentations are going to be
17 totally unrestricted in terms of time. This is a case
18 for which we are not yet, presumably, to the halfway
19 point. We have already been sitting many, many months
20 and we have all of the parties in opposition yet to
21 address the Board and we have some 13 or 14 other
22 locations to visit around the province to hear from the
23 public.

24 There is a duty on this Board and all
25 other tribunals, and I would submit upon the court

1 system in general, to ensure that when complex
2 proceedings are put before the Board they are handled
3 in an expeditious way which must, of course, represent
4 the ability for the parties to present their cases
5 fairly, and we have endeavoured throughout to abide by
6 those precepts.

7 Now, when Mr. Hanna on behalf of his
8 client indicated to the Board last time that he would
9 be no more than two hours, we took that at face value.
10 On that basis we scheduled other parties to be prepared
11 to continue.

12 As many of you are aware, as recently as
13 last week we have indicated clearly to the parties that
14 it has become necessary for the Board to become more
15 vigilant and to expect that the parties who are next in
16 line to be prepared to proceed immediately after the
17 party preceding has completed. Over the past three or
18 four weeks we have lost a few hours, if not days,
19 because parties have finished earlier than anticipated,
20 for which the Board certainly is not criticizing any
21 party.

22 Perhaps some of the scoping procedures
23 and some of the other procedures that the Board have
24 adopted over the course of the hearing have actually in
25 fact compressed the presentation of some of the

1 evidence.

2 But we have to, in our view, draw a fine
3 line between allowing a party an adequate opportunity
4 to cross-examine or present its evidence and ensuring
5 that this hearing is not totally out of control in
6 terms of the time it will take to present the case on
7 behalf of all parties.

8 The best estimates, as far as the Board
9 is concerned, indicate that we have probably at least
10 18 months more of evidence to present, and that does
11 not include the time it will take subsequent to the
12 hearing of the evidence to render a decision.

13 We will be literally well over a thousand
14 or even two thousand exhibits that will probably have
15 been admitted by the end of this case, and I won't even
16 speculate on the number of pages of transcript that
17 this hearing will have occupied at the end.

18 It is a dynamic process, it is not the
19 type of case where it is likely to be decided on five
20 minutes' worth of evidence throughout a period of time
21 which has occupied in terms of years.

22 Now, we are cognizant of the parties'
23 concerns over the Board trying to limit any of the
24 parties in terms of the time they have available for
25 cross-examination, but we can't stress enough the

1 necessity that all parties are going to have to take to
2 to structure their examinations so that the points that
3 they wish to address are brought out in a cogent,
4 expeditious fashion.

5 We have cautioned all of the witnesses
6 pretty well who have appeared before us to listen to
7 the questions and to answer the questions as concisely
8 as possible, bearing in mind that they do have the
9 opportunity to provide a full answer. On the other
10 side of the coin, we have asked counsel and all other
11 persons representing parties to cross-examine and
12 formulate their questions in a way that will elicit
13 clear answers. It's a two-way street. It's the only
14 way the Board feels that it can manage this proceeding.

15 Now, our ruling this morning was based on
16 the fact that Mr. Hanna himself indicated to the Board
17 that he would require no more than two hours to
18 complete the examination of these two witnesses. On
19 that basis we made certain scheduling decisions. We
20 realize that the answers were somewhat more lengthy
21 than perhaps were contemplated, but we feel that
22 throughout we have attempted in all cases to allow the
23 parties to present their side of the case or
24 cross-examine fully and fairly.

25 Now, in view of counsel's submissions to

1 the Board this morning - and this is something we
2 discussed during the recess ourselves - we are prepared
3 to continue on at this time with Ms. Kleer's
4 cross-examination and, Mr. Hanna, should you wish to
5 avail yourself of additional time to cover areas that
6 you haven't already covered, and we would ask you to
7 spend the time during which Ms. Kleer is addressing the
8 Board to review your cross-examination and clearly
9 extract only those areas for which you have not
10 covered.

11 If you feel there are additional
12 questions that you wish to ask these witnesses, then
13 the Board will allow you the time to do so after Ms.
14 Kleer has finished. We do hope again, in the interest
15 of the entire proceeding, that you can, in a concise
16 way, limit your further cross-examination to those
17 areas you haven't already covered, and we will proceed
18 on that basis.

19 The Board - and I might as well be frank
20 because we have discussed this amongst ourselves many
21 times - is going to be more vigilant in the future in
22 terms of both time estimations and what we feel is
23 relevant examination because to do otherwise would
24 allow this proceeding, in our view, to continue on to
25 the point where it is unreasonable in terms of the

1 obligations that are visited upon the Board, the
2 parties and the public at large.

3 So on that basis we are prepared to hear
4 some further cross-examination, Mr. Hanna, if you feel
5 it's necessary and we would ask you to use the next few
6 hours to arrange that examination so that we are not
7 covering ground that we covered both this morning or
8 when you last examined a couple of weeks ago.

9 MS. CRONK: On behalf of all counsel, Mr.
10 Chairman, we thank the Board.

11 THE CHAIRMAN: Very well.

12 Ms. Kleer?

13 MS. KLEER: I will be addressing most of
14 my questions to Mr. Kingsbury.

15 CROSS-EXAMINATION BY MS. KLEER:

16 Q. Mr. Kingsbury, firstly I would like
17 to go through a few of the points that you raised in
18 your direct evidence some time ago.

19 I believe that you had stated that there
20 was no evidence of significant bioconcentration or
21 biomagnification of any of the pesticides registered
22 for use in Ontario forests with respect to fish. Is
23 that your recollection?

24 MR. KINGSBURY: A. Would you care to --
25 are you referring to something that's right in the

1 transcripts? I'm not sure the reference was directly
2 to fish. I know I made a statement along that line,
3 but I'd just like to be sure.

4 Q. Well, I was looking at my notes.

5 A. Okay.

6 Q. Let me ask you again: Is there --
7 asking you now, is it your evidence now that there is
8 no evidence of significant bioconcentration or
9 biomagnification of any of the pesticides registered
10 for use in Ontario with respect to fish?

11 A. Okay. I believe -- I'm sorry, I
12 didn't listen to the question right. Bioconcentration,
13 biomagnification in terms of how we define those--

14 Q. In the ESSA Document.

15 A. --in the ESSA Document, yes.

16 Q. Okay. Just for the sake of the
17 Board's clarification, I would like you to go through
18 what the definition of bioconcentration is as defined
19 in the ESSA Document?

20 A. Okay. The definition that's in the
21 ESSA Document is, it denotes a situation where
22 concentration of the pesticide in an animal is greater
23 than in its environment.

24 And I believe that in the
25 cross-examination with Ms. Cronk on page 20515 we -- at

1 the bottom of that page there are a series of questions
2 in which I agreed with her that this is a very dynamic
3 process; there is a lot of things that need to be taken
4 into consideration.

5 If you just give me a second I think
6 there may be a relevant quote in there that adds to the
7 direct evidence. Basically the addition to that was
8 talking about a time element in terms of concentration
9 in the environment, concentration in the organism.
10 Does that clarify?

11 Q. Yes, I just basically wanted to get
12 what the definition was.

13 A. Okay.

14 Q. I would like to refer now to two
15 papers by a Mr. Kanazawa.

16 A. Right.

17 Q. And I believe I have distributed
18 those to you earlier.

19 MS. KLEER: The first one appears in the
20 Bulletin of Environmental Contamination & Toxicology,
21 and at this point I would like to distribute that to
22 everyone.

23 THE CHAIRMAN: Okay. That will be
24 Exhibit 780 -- I'm sorry, that should be 790.

25 MS. KLEER: (handed)

1 THE CHAIRMAN: Thank you.

2 ---EXHIBIT NO. 790: Article entitled: Uptake and
3 Excretion of Organophosphorus and
4 Carbamate Insecticides by Fresh
Water Fish, Motsugo, authored by
Jun Kanazawa.

5 MS. KLEER: Q. Referring then to exhibit
6 790.

7 MR. KINGSBURY: A. Yes.

8 MS. CRONK: Excuse me, Mr. Chairman,
9 could I please have clarification, which one is which?
10 Which is 790?

11 THE CHAIRMAN: We have marked the
12 Kanazawa paper as Exhibit 790.

13 MS. KLEER: 790 is Uptake and Excretion
14 of Organophosphorus and Carbamate Insecticides by Fresh
15 Water Fish, Motsugo.

16 MS. CRONK: And I understand for the
17 second -- the second Kanazawa paper is 7 --

18 THE CHAIRMAN: That will be 791.

19 MS. CRONK: Thank you.

20 ---EXHIBIT NO. 791: Article entitled: Relationship
21 Between the Molecular Weights of
Pesticides and their
22 Bioconcentration Factors by Fish,
by Jun Kanazawa, published in
23 Experientia Journal.

24 MS. KLEER: Q. Now, first of all, the
25 Bulletin of Environmental Contamination & Toxicology is

1 a refereed journal; is it not?

2 MR. KINGSBURY: A. Actually my belief is
3 that these articles are submitted photo-ready and are
4 refereed by the editor only, not by outside --

5 Q. You have published in this bulletin?

6 A. Yes.

7 Q. Yes. In this study, was the purpose
8 of the study to examine uptake of insecticides
9 including carbaryl and fenitrothion in the lab context?

10 A. Yes, uptake and excretion.

11 Q. And this was done on a particular
12 fresh water fish; is that correct?

13 A. Yes.

14 Q. If you will turn with me to page
15 348--

16 A. Yes.

17 Q. --and 349, did the authors of this
18 study find that after three or four days the
19 concentration of fenitrothion was higher in these fish
20 than after one day?

21 A. Yes. In terms of a straight
22 comparison of the terms on a part per million basis,
23 yes.

24 Q. I would like to turn to the graph on
25 page 349. And looking at the fenitrothion graph

1 specifically--

2 A. Yes.

3 Q. --does this indicate that the
4 concentration of the fenitrothion in the fish ranged
5 from approximately 160 parts per million to a smaller
6 amount?

7 A. Yes.

8 Q. Is it also true that Mr. Kanazawa
9 found that throughout the study the concentration of
10 the fenitrothion in the water was in fact lower than
11 that in the fish?

12 A. That's correct.

13 Q. So does it not appear to you from
14 this study that in fact fenitrothion did bioconcentrate
15 as bioconcentration is defined in the ESSA Document?

16 A. I guess what I would suggest is that
17 what we see here is a very common occurrence.
18 Depending on the relative solubilities of a pesticide
19 or other materials, in fact heavy metals, whatever in
20 things like water and fat there is sort of a --
21 initially - and this of course is true even if you have
22 a non-living system - an equilibration where there's a
23 movement of a material between two different solvents,
24 be it animal fat or water, that is related to their
25 solubilities in those different substances.

1 I would say that although some people
2 might call this bioconcentration it is more appropriate
3 to call it bioaccumulation where it says there's -- in
4 the ESSA Document we defined bioaccumulation as where
5 the pesticide may be found in the biota, but in
6 contrast to bioconcentration and it says here, and I
7 would agree that this may be somewhat confusing, in
8 measurable concentrations irrespective of those found
9 in its environment.

10 I guess what I would suggest is the
11 important thing here is the fact that following this
12 initial movement the organism shows a rapid ability to
13 deal with the pesticide residues present within the
14 organism, shows that many of these other factors of
15 metabolism break down, excretion are coming into play,
16 that in fact say that bioconcentration, in the sense of
17 an elevation of residues within an organism well above
18 what's in the environment for a persistent period of
19 time, is not going to occur.

20 Now, within the strict definition of:
21 Are the residues higher in the fish than in the water;
22 yes, I would agree, but I would also suggest that
23 because a fish is not just a fishy lump of water but
24 contains things like fats, or even if the fish was
25 dead, there may be some -- a higher propensity just on

1 a straight physical basis for the material to be
2 soluble in that to a greater extent than in water;
3 there's more in it.

4 Q. Okay. But isn't it true then that as
5 defined in the ESSA Document bioconcentration in fact
6 occurs, so that you do have a higher concentration in
7 a fish in this case than you do in the water?

8 A. Yes.

9 Q. Is the same true with respect to
10 carbaryl, and I would refer you to Figure 2 on page
11 350. At all times throughout this study, I guess here
12 it's done for 10 days, was the carbaryl at higher
13 concentration in the fish than in the water?

14 A. Yes, it was and I think that there is
15 a difference there, but it's probably more apparent
16 when we get to the next paper, if you are going to deal
17 with it, just to make a comparison.

18 Q. All right. Then let's turn to the
19 next paper which I have already distributed and that is
20 Exhibit 791.

21 THE CHAIRMAN: That's correct, 791.

22 MS. KLEER: Q. This was published in the
23 Experientia Journal and again is that a refereed
24 journal as far as you know?

25 MR. KINGSBURY: A. Yes.

1 Q. In this article, which is a 1981
2 article, the author is seeking to determine if there is
3 a relationship between the molecular weight of
4 pesticides and their bioconcentration factor; is that
5 correct?

6 A. Yes.

7 Q. Now, when he uses the term
8 bioconcentration factor here, do you know what that
9 means specifically?

10 A. It is my belief that when he's using
11 that term - I remember this when I reviewed it the
12 first time and I can't find it - that he's dealing with
13 an equilibrium situation where he's basically
14 maintaining a level in the environment at a certain
15 point and giving the organism more or less an unlimited
16 opportunity to acquire that, to take up that material
17 without having it decline in the environment, what the
18 relationship between those two numbers are when the
19 organism ceases to show any further bioaccumulation of
20 the material.

21 Q. So at equilibrium then?

22 A. At equilibrium, yes.

23 Q. All right. I would agree with that.
24 I would like to turn to the second page of this
25 exhibit.

1 A. Yes.

2 Q. And specifically to carbaryl and
3 fenitrothion.

4 A. Yes.

5 Q. What is the bioconcentration factor
6 indicated for carbaryl?

7 A. 9.

8 Q. And for fenitrothion?

9 A. 246.

10 Q. And do you accept these as
11 scientifically valid figures?

12 A. Yes. I would suggest that there is
13 other studies that would show a range that these would
14 fall within very much. I would also like to point out,
15 however, that what is really the significant point here
16 is that when one looks at a material like DDT - which,
17 of course, is well known not only for its
18 bioconcentration but its biomagnification - that the
19 figure for DDT is 29,400, okay, which is suggesting
20 that for both of these materials under equilibrium with
21 no ability to respond because the concentrations in the
22 environment have declined, a material that is known to
23 biomagnify and concentrate has a bioconcentration
24 factor that is two or three orders of magnitude higher
25 than the levels for fenitrothion and carbaryl.

1 Q. I accept that. I just simply want to
2 have it on the record that these substances do in fact
3 bioconcentrate?

4 A. According to some definitions of the
5 use. Now, where this really gets difficult and
6 where -- when you go out into the environment because
7 perhaps fish in a lab is the easiest situation to make
8 a direct measurement between what is in the environment
9 and what is in the organism; when you get out into the
10 forest system it becomes much more difficult,
11 particularly in terrestrial systems, because how do you
12 measure the exposure that may be within leaves or on
13 ground or in food that is being ingested and compare
14 that to what is in an organism.

15 It's easy to come up -- well, not easy,
16 but it's possible to do the chemical analyses that give
17 you numbers, but it's difficult to say that this number
18 relates to what is in that number.

19 Q. I am not suggesting that that is in
20 fact not the case, but given that it is so difficult to
21 deal with these situations within a natural
22 environment, does this not serve as some surrogate
23 measure for the extent of bioconcentration that may
24 occur in the natural environment?

25 A. It does and it also suggests to me

1 that there are two very important things to look at;
2 one is residues within organisms out in natural
3 environments over time.

4 Q. Mm-hmm?

5 A. And to see: Do those residues in
6 fact remain at a certain level for extended periods of
7 time and; secondly, to look at the laboratory
8 metabolism studies that say: When you continue to
9 input it into an organism, what does it do with it;
10 does it simply store it or can it metabolize them.

11 Q. Well, would you agree with me that if
12 you combine the factors of simply taking up--

13 A. Mm-hmm.

14 Q. --the pesticide through the gills and
15 you combine it with ingestion of the pesticide through
16 ingestion of aquatic invertebrates that you might in
17 fact have a higher concentration in fish than simply
18 through equilibration in the environment?

19 A. It's a possibility although there are
20 very, very different ways of dealing with the material
21 and I think Dr. Ritter speaking about humans talked
22 about the differences between the material coming
23 through the stomach and, say, coming through the skin.

24 I would caution the same thing is true,
25 in fact it tends to be difficult from -- materials that

1 are coming through the stomach tend to be processed
2 very differently than material that is coming through a
3 gill membrane.

4 Q. Okay. I would like now to turn to
5 studies on aquatic invertebrates. You had stated in
6 your evidence that aminocarb had lower or lesser
7 effects on aquatic invertebrate populations than did
8 carbaryl and fenitrothion; is that correct?

9 A. That's correct.

10 Q. And do you agree with the obverse
11 then that carbaryl and fenitrothion would have greater
12 effects than aminocarb?

13 A. Yes.

14 Q. And you have also written in the
15 paper that formed part of Exhibit 712 which is
16 entitled: Pesticides in Forestry and Agriculture, and
17 I would like to turn to page 259 in that document.

18 MS. CRONK: Sorry, what is the number --
19 exhibit number?

20 MS. KLEER: Exhibit 712, page 259.

21 MS. CRONK: Thank you.

22 MS. KLEER: Q. I am looking at the third
23 line in the pros section, it reads:

24 "That there have been cases of more
25 complete and longer lasting impacts of

1 permethrion and carbaryl on
2 the most sensitive invertebrate groups."
3 Is that still your professional opinion?

4 A. That's right. And I believe my
5 direct evidence referred to those carbaryl impacts with
6 the data primarily reflecting forest pond situations
7 with acidic and highly coloured waters.

8 Q. I would like to look at a report by
9 Gibbs, et al of 1984 and distribute that at this point.

10 MS. KLEER: (handed)

11 THE CHAIRMAN: Thank you. Exhibit 792.

12 ---EXHIBIT NO. 792: Report entitled: Persistence of
13 Carbaryl (Sevin-4-Oil) in Woodland
14 Ponds and its Effects on Pond
15 Macroinvertebrates Following
Forest Spraying by Gibbs, et al,
1984.

16 THE CHAIRMAN: Ms. Kleer, when you get a
17 moment, we will need a second copy as well. We need
18 one copy for the record.

19 MS. KLEER: I thought I gave you four. I
20 am sorry.

21 THE CHAIRMAN: I think there is only
22 three.

23 MS. PALOWSKI: (handed)

24 THE CHAIRMAN: Thank you.

25 MS. KLEER: Q. I take it you're familiar

1 with this, Mr. Kingsbury?

2 MR. KINGSBURY: A. Yes.

3 Q. And it is in a refereed publication;
4 is that correct?

5 A. Yes.

6 Q. Now, did the authors in this study
7 conclude that some amphipods failed to recolonize in
8 some ponds for up to 30 months after receiving direct
9 overspray of Sevin-4-Oil?

10 A. That's correct.

11 Q. And Sevin-4-Oil is a carbaryl
12 formulation; is that correct?

13 A. Yes, that's correct. It's a
14 formulation which, given the lack of the use pattern in
15 Ontario, I am not sure whether it would be the material
16 used now, because certainly there have been a variety
17 of other formulations registered since. That's not to
18 reflect on the fact that the new formulations may not
19 have the same effects.

20 Q. Would you characterize a 30-month
21 effect as a long-term effect?

22 A. Definitely.

23 Q. Now, do the authors at page 208 and
24 209 conclude that:

25 "This failure to recolonize could be due

1 to the toxicity of persistent carbaryl
2 residues."

3 A. That's 208 and 209 are the pages you
4 are referring me to?

5 Q. That is correct. I may have them
6 wrong in my notes.

7 A. Certainly in these studies it is
8 reported -- carbaryl residues are reported in -- and
9 there is quite a number of studies along this, this is
10 one of the series so -- but I think the carbaryl
11 residues are reported in sediment in water and they are
12 shown to persist for some period of time and that may
13 in fact account for the fact that there is not
14 recolonization of amphipods in these ponds.

15 Q. So you agree then that the failure to
16 recolonize may be due to the possible toxicity of these
17 residues?

18 A. Yes. It would suggest to me that
19 when there is an initial dramatic effect on the
20 population that's limited what might be available to
21 reproduce and; secondly, because there is still
22 persistent residues, particularly in the substrates,
23 because amphipods are basically invertebrates that,
24 one, inhabit the pond sediments and; secondly,
25 process -- are involved in ingesting and breaking down

1 a great deal of it and would be exposed to the residues
2 in the process of their normal activities, that there
3 might still be toxicity from these levels of residues.

4 Q. The amphipods generally are important
5 within the stream eco-system; is that correct?

6 A. Well, in this case it's -- these
7 studies have taken place in small ponds and I guess
8 there is a number of points.

9 Amphipods are found in some stream
10 systems. They tend to not be dominant in stream
11 systems depending on the water chemistry. In a lime
12 stone area they may in fact be fairly common. In many
13 of the streams in the area of the undertaking, they
14 probably wouldn't be.

15 They are more likely to show up in the
16 kind of situation that is studied here which is a small
17 pond -- forest pond, I guess for want of a better
18 description of it, and they can be significant in terms
19 of biomass and potential food to other wildlife.

20 Q. And there are, of course, small
21 forest ponds within the area of the undertaking; is
22 that correct?

23 A. Yes, and some of them I am sure would
24 have amphipods. I just make reference to your question
25 of further streams.

1 THE CHAIRMAN: Mr. Kingsbury, are the
2 carbaryl residues affected by -- or attenuated or
3 affected by dilution in a moving body of water such as
4 a stream or river?

5 MR. KINGSBURY: Very much so and in my
6 direct evidence and in I think Exhibit 712 there was in
7 fact a figure showing the rapid dissipation of them.

8 I would also suggest that not only that -
9 that is primarily a dynamic process - chemical
10 breakdown in many types of waters is also much more
11 rapid than these pond situations where it has been
12 suggested, because of the high acidity and the low
13 light penetration, the conditions for chemical
14 breakdown of carbaryl are much less than we would find
15 certainly in streams.

16 MS. KLEER: All right. I would like to
17 turn now to a study that I believe is on streams and
18 this is by Courtemanch and Gibbs and I would like to
19 distribute it now. (handed)

20 THE CHAIRMAN: Thank you. Exhibit 793.

21 ---EXHIBIT NO. 793: Article entitled: Short- and
22 Long-Term Effects of Forest
23 Spraying of Carbaryl (Sevin-4-Oil)
on Stream Invertebrates by
Courtemanch and Gibbs.

24 MS. KLEER: Q. You would agree with me
25 that this study, Mr. Kingsbury, was performed on the

1 streams in the northern Maine District; is that
2 correct?

3 MR. KINGSBURY: A. I think so, Ms.
4 Kleer. I am having some trouble finding it.

5 Q. It's Canadian Entomologist, Volume
6 112?

7 A. Okay, thank you. Yes.

8 Q. So you agree then that this is with
9 respect to streams?

10 A. Yes.

11 Q. And the carbaryl that was applied in
12 this instance, was that applied at the normal
13 application rates for forestry applications?

14 A. Well, I have a bit of difficulty
15 there simply because we haven't had a use pattern for
16 carbaryl for some years in Canada, let alone Ontario,
17 and I would suggest that, as a for instance, this study
18 is done at an application rate equivalent to - if I
19 might convert back to ounces, simply because most of
20 the carbaryl data refers to ounces or pounds - because
21 carbaryl was the material of choice in the State of
22 Maine for budworm suppression for many, many years.

23 It has not been a material of choice in
24 Canada, partly because there were different feelings
25 across the border as to which was the more appropriate

1 material to use.

2 In the State of Maine, in this case
3 carbaryl, was applied at 12 ounces per acre or 840
4 grams active per hectare.

5 When We did work in the Forest Pest
6 Management Institute we looked at carbaryl for spruce
7 budworm control in 1980 and evaluated it at one third
8 of this rate, okay, at 4 ounces per acre or 280 grams
9 per hectare.

10 Q. I am a bit confused because in the
11 ESSA Document at page 32 it indicates that the maximum
12 registered rate application for carbaryl is 1230 grams
13 per hectare and Ontario's normal rate is 850 grams per
14 hectare.

15 A. That's correct. But I might just
16 caution that those numbers are there in the absence of
17 a use pattern.

18 Q. But they are registered for use?

19 A. They are registered for use, those
20 rates. And carbaryl - and I believe Dr. Churcher
21 probably indicated this in his direct evidence - is
22 primarily considered a material for use against gypsy
23 moth and some other things like oak leaf shredder
24 perhaps. Certainly it hasn't been considered
25 historically in Ontario a primary option for things

1 like spruce budworm control.

2 Q. Well, I recognize that, but I think
3 we are dealing with that in this theory.

4 A. Yes.

5 Q. At page 277 of this study, did the
6 authors conclude that carbaryl was toxic to all the
7 plecoptera, some ephemeroptera, certain trichoptera and
8 diptera?

9 A. My copy seems to have lost the
10 numbers off the top or bottom. Is this a page where
11 the discussion section is?

12 Q. It's the second last page.

13 A. Thank you.

14 Q. The report starts at page 271, so you
15 can number your report.

16 A. Yes. Carbaryl was particularly toxic
17 to all plecoptera and also most of the ephemeroptera,
18 certain trichoptera and diptera.

19 Those groups, if I might clarify, would
20 be basically stone fly nymphs, may fly nymphs, caddis
21 fly larvae, and various aquatic fly larvae.

22 Q. These are common aquatic invertebrate
23 groups in streams; is that correct?

24 A. That's correct.

25 Q. And that applies in the area of the

1 . undertaking as well as in Maine?

2 A. Yes.

3 Q. Did they conclude that low initial
4 populations of plecoptera in streams which had been
5 sprayed the year before implied that there was a
6 long-term suppression of plecopterans by carbaryl and
7 in the case of one specific species, complete
8 suppression?

9 A. That's correct. And there are other
10 studies that would support the conclusion that - and I
11 would just indicate that in the time that these studies
12 were carried out, there were very few, if any, buffer
13 zone restrictions applied to these spray programs in
14 Maine - that where streams had been oversprayed
15 directly in previous years, there was evidence that
16 there were long-term reductions especially of stone
17 flies, plecoptera.

18 Q. I was going to get to that. Actually
19 in your evidence on the Carnation Creek experiment I
20 believe that you had indicated that there was a rain
21 event that followed the spraying in one particular
22 instance and that following that rain event there was
23 rapid increase in the concentration of the particular
24 pesticide in question?

25 A. Yes, this was with reference to

1 glyphosate -- the herbicide glyphosate.

2 Q. And there are various sources by
3 which a pesticide can reach a stream in addition to
4 overspraying such as over land flow following a rain?

5 A. Absolutely, but I would just indicate
6 too that with insecticides, simply because the amount
7 of material that is applied and also the target areas,
8 the fact that they are applied to mature forests, the
9 evidence would certainly indicate far less of that
10 insecticide might be washed into a stream than a
11 herbicide which, of course, can be applied to a site
12 with very little vegetative cover at a much --
13 sometimes at a much higher dosage rate.

14 Q. Do you have any relative specifics as
15 comparing herbicides and insecticides?

16 A. I would simply note that the kind of
17 very pronounced spike in residues following a rain
18 event that we saw in Carnation Creek is certainly very
19 atypical of anything we have ever seen with
20 insecticides.

21 Now, I would again say one of the reasons
22 for that is the nature of that Carnation Creek site.
23 This is a very steep coastal B.C. stream with very
24 significant rain event, it's prone to that kind of
25 event.

1 But certainly it would be highly abnormal
2 to see that kind of a spike following insecticide
3 application and we have studied many of these.

4 Q. You have studied them in the case of
5 insecticides?

6 A. Yes, not with -- with carbaryl the
7 only data you will find is the data that I presented
8 before the Board in Canada, okay, and in that case
9 there was no evidence of such an increase in residues
10 following a rain event.

11 THE CHAIRMAN: Mr. Kingsbury, are you
12 indicating that the rates applied in this latest study,
13 Exhibit 793, would be at three times the rate normally
14 applied in Ontario?

15 MR. KINGSBURY: They are at three times
16 the rate that the carbaryl was studied in the paper
17 that -- the specific study referenced in the paper.

18 In the -- again, I would suggest that in
19 the absence of a use pattern of carbaryl, the
20 entomologists themselves - given that we are talking
21 about a different bug now, we are talking primarily
22 gypsy moth, there might be a modification of the rate;
23 there may not be - they may in fact end up applying at
24 the same rate, but it would be applied, of course,
25 under today's conditions where buffer zones, things

1 like that, would come into play.

2 THE CHAIRMAN: But does it follow that
3 the toxicity to these invertebrates would be directly
4 related to the amount of dosage?

5 MR. KINGSBURY: Absolutely.

6 MS. KLEER: Well, Mr. Chairman, I just
7 want to leave it on the record that my understanding
8 is - and perhaps you can confirm this, Mr. Kingsbury -
9 that at present you don't really know what the
10 application rates are in Ontario.

11 MR. KINGSBURY: Carbaryl has not been
12 applied by the Ministry in Ontario for at least four,
13 and I suspect that it would be -- I think the last
14 application of carbaryl by the Ministry in this
15 province by aircraft anyways was associated with the
16 very early stages of gypsy moth around the year 1980.

17 MS. KLEER: Q. And at that time I would
18 suggest that looking at the ESSA Document they actually
19 used a higher application rate than 240 grams per
20 hectare--

21 MR. KINGSBURY: A. Yes.

22 Q. --i.e., 850 grams per hectare?

23 A. I believe that's correct.

24 Q. And we don't know what they use it at
25 at present?

1 A. And they don't use it.

2 Q. They don't use it.

3 THE CHAIRMAN: What is the relevance at
4 this point in time? You are not suggesting; are you,
5 Ms. Kleer, that there would be any residues necessarily
6 left four years after the last application in this
7 province; would you?

8 MS. KLEER: I am not suggesting that. I
9 am suggesting that if we were to recontinue use of this
10 that we could have this problem of persistence
11 occurring.

12 THE CHAIRMAN: Okay.

13 MR. KINGSBURY: And I would agree, if the
14 material was introduced into these types of systems.
15 Again, however, I would indicate this is an
16 experimental direct overspray with relation to the
17 pond.

18 MS. KLEER: Q. May I correct you. Is
19 this with respect to streams? This particular study by
20 Courtemanch and Gibbs is streams --

21 MR. KINGSBURY: A. This is with respect
22 to operational treatment of large forest blocks and
23 it's my understanding that there were no buffers, while
24 in fact the paper says these streams were oversprayed
25 with the carbaryl.

1 THE CHAIRMAN: Is the Ministry, Ms.
2 Murphy, asking for a continued approval to use this
3 chemical in Ontario for forest management?

4 MS. MURPHY: I think the position, Mr.
5 Chairman, is that we have dealt in the evidence with
6 all of the currently registered products. Whether at
7 any particular point in time or not they are currently
8 being used, we would suggest at this point in time
9 it's not relevant, and we have no difficulty with my
10 friend pursuing this. We have led this evidence so you
11 can hear evidence about the registered material.

12 THE CHAIRMAN: Well, if you are asking
13 for a blanket approval but indicating that you are not
14 using it at the present nor have any particular
15 inclination to use it in the future but, nevertheless,
16 you want an approval in case you decide to, it becomes
17 fairly relevant as to what the toxic or non-toxic
18 effects of these chemicals are; does it not?

19 MS. MURPHY: Exactly. In fact, if I just
20 step back for one minute. What we are saying, Mr.
21 Chairman, is that the Ministry is stating that they are
22 looking for approval to do forest management. One of
23 the things that they would do is to use products that
24 are registered.

25 This product is, although not currently

1 used in Ontario, a product that is registered for
2 forestry applications. That is the reason why I
3 wouldn't suggest that my friend's questions are
4 irrelevant.

5 MR. KINGSBURY: I might have...

6 THE CHAIRMAN: But - just one second, Mr.
7 Kingsbury - but you will concede, I take it, that for
8 the purposes of this hearing, based on the Board's
9 earlier ruling, the parties could contest a particular
10 use of a particular chemical notwithstanding that it
11 has been registered.

12 I realize what the Ministry's position
13 is, you are relying on the registration, but in terms
14 of the Environmental Assessment, the Board could
15 presumably find otherwise, at least the way it has
16 interpreted its jurisdiction.

17 MS. MURPHY: Yes. That was our
18 submission on the motion, Mr. Chairman, when you were
19 asked you did say that and it is reflected in your
20 judgment as well.

21 THE CHAIRMAN: Okay.

22 MR. KINGSBURY: Could I make a comment,
23 Mr. Chairman, on that?

24 THE CHAIRMAN: Yes.

25 MR. KINGSBURY: Ms. Kleer has indicated

1 and asked me regarding the effects of aminocarb versus
2 the effect of carbaryl and fenitrothion, and I
3 certainly would agree with her that aminocarb is a
4 material that poses less hazard to aquatic
5 invertebrates. It is still registered in Canada, but
6 is not a material that is commercially available any
7 more simply because the manufacturer has ceased to make
8 it available.

9 It's possible it could be available when
10 the Ministry chose to use it, but the fact is that you
11 have heard evidence about the limited market and the
12 difficulties of getting these materials registered, and
13 I would just caution against the fact that if the
14 Ministry is restricted to using this or that material,
15 that material may not in fact be available for a number
16 of commercial or reasons that have nothing to do with
17 environmental effects.

18 I would also caution that every material
19 should be evaluated in terms of its entire range of
20 effects. The State of Maine for many years chose Sevin
21 very consciously over aminocarb or fenitrothion and
22 that may have reflected the fact that they felt that,
23 given the balance of concerns, it was the best material
24 for them.

25 In fact, Ontario consistently chose

1 aminocarb as the material for spruce budworm programs
2 when they had the option to use it.

3 MS. KLEER: Q. I just have one question.
4 You indicated that this, of course, was a study where
5 direct overspray occurred. Are you aware of any
6 studies specifically with respect to carbaryl similar
7 to this where a buffer zone was applied?

8 MR. KINGSBURY: A. There are studies of
9 that nature, yes.

10 Q. Are they extensive?

11 A. There certainly are several studies
12 that look at two things; one is the occurrence of stone
13 flies in buffered streams and also I believe there are
14 studies on the occurrence of stone flies in streams
15 that have had an unsprayed area upstream from spray
16 blocks.

17 I can certainly refer you to the
18 bibliography by Joan Trial, which I think you will find
19 referenced on page 4 of the ESSA Document, an annotated
20 bibliography of the Environmental Effects of
21 Insecticide Use for Spruce Budworm Control, Trial,
22 1986.

23 I don't have those studies with me and I
24 would have to review them to be able to answer
25 questions on them.

1 Q. All right. Then I will just leave it
2 for now. Then, I would like to turn briefly to the
3 effects on songbirds of insecticides.

4 Now, I understand that Mr. Castrilli
5 dealt with this at some length with respect to
6 fenitrothion with you and I went through my originally
7 prepared cross-examination and tried to limit it only
8 to aminocarb. I have one comment that I would like to
9 make at the end with respect to fenitrothion, but I
10 will be dealing with aminocarb at this point.

11 A. Yes.

12 Q. In the ESSA Document at pages 57 and
13 58 we are referred to the National Research Council of
14 Canada's study on aminocarb which was a 1982 report. I
15 have the full report here, I didn't think it was
16 necessary to copy the whole thing, and I will just
17 produce to the Board an extract on the conclusions with
18 respect to aminocarb, if I may.

19 A. Okay. I would indicate to the Board
20 that that is in fact a review by a scientific review
21 panel, it isn't a study -- an original research on the
22 subject.

23 Q. I accept that.

24 MS. KLEER: (handed)

25 MR. KINGSBURY: Ms. Kleer, I don't

1 believe I have those extracts in my package.

2 THE CHAIRMAN: This excerpt will be
3 Exhibit 794.

4 MS. KLEER: (handed)

5 MR. KINGSBURY: Thank you.

6 THE CHAIRMAN: What's the full name of
7 the document that this is coming from?

8 MS. KLEER: Aminocarb: The Effects of
9 Its Use on the Forest and the Human Environment, and
10 it's 1982, National Research Council of Canada.

11 THE CHAIRMAN: Thank you.

12 ---EXHIBIT NO. 794: Extract of a document entitled:
13 Aminocarb: The Effects of Its Use
14 on the Forest and the Human
Environment, dated 1982, National
Research Council of Canada.

15 MS. KLEER: Q. Now, at pages 57 and 58
16 of the ESSA Document it states at the bottom of page 57
17 that:

18 "The NRCC in 1982 provided a detailed
19 review of field monitoring studies of
20 aminocarb toxicity on birds."

21 And they concluded that:

22 "Only relatively minor impact on the
23 activity of forest songbirds have been
24 detected and only when aminocarb was
25 applied twice or in regimes involving

1 prior application of fenitrothion or
2 phosphamidon."

3 MR. KINGSBURY: A. Phosphamidon.

4 Q. Sorry. They caution, however,
5 that -- and I quote again:

6 "The toxicity and exposure data
7 considered together suggests that at
8 least in the worst case aminocarb could
9 have some effect on small crown canopy
10 birds."

11 I would like to refer to the excerpt that
12 I have given you on page 24, the bottom paragraph.

13 They indicate there that one of the
14 reasons that the adverse effects might not be
15 detected -- the adverse effects of aminocarb might not
16 be detected in the field through detection on dead or
17 sick birds is that predators would quickly remove these
18 dead or sick birds, and so that using current census
19 techniques a lethal impact is likely to be detected
20 only if it is catastrophic.

21 Do you agree with that statement?

22 A. No, I don't agree with the statement
23 because, in fact, most of the studies don't just look
24 for dead birds, they in fact census populations and the
25 population data certainly would indicate that we're --

1 we do not find effects on songbird populations after
2 aminocarb sprays. That's a very, very extensive body
3 of literature.

4 Q. So you're saying that this opinion is
5 wrong in your opinion?

6 A. I would suggest that the important
7 thing here is that they are saying: Well, if you don't
8 find dead birds it doesn't mean that there weren't dead
9 birds. But, in fact, the fact is we have censused the
10 population extensively in aminocarb sprayed areas and
11 not seen impacts. That's a much more reliable
12 indicator to me of lack of effect.

13 Q. When you census a population, what
14 methodology are you using?

15 A. There is a variety of methodologies,
16 some of which only count song, but the method of which
17 the group that I was associated with used for many
18 years was a territorial mapping where the presence of a
19 breeding male within his breeding territory was
20 evaluated before and after spray application.

21 This gives us the ability to say that
22 whether a breeding territory disappeared, you might
23 be -- you might argue that you could in fact remove a
24 breeding male and have his territory replaced by a
25 non-breeding individual, and that is a possibility.

1 But the fact is that when study after
2 study show no disruption of number of breeding
3 territories, it indicates that we're not -- certainly
4 not killing breeding males to any extent at all, and
5 that of course is supported by the fact we don't find
6 dead birds.

7 Q. I would like to turn briefly to the
8 subject of cholinesterase activity reduction or
9 inhibition?

10 A. Yes.

11 Q. Now, I believe that that is a
12 reversible effect; is that correct?

13 A. Yes.

14 Q. And in your evidence in
15 cross-examination by Mr. Castrilli you took some issue
16 with other scientists such as Zinkl and Busby who have
17 concluded that cholinesterase reduction is in fact
18 evidence -- well, 50 per cent cholinesterase reduction
19 or greater is in fact evidence of a life-threatening
20 situation?

21 A. That's correct.

22 Q. But there are, you would agree,
23 several scientists who do take this position?

24 A. I would say -- I would agree that on
25 the basis of lab studies that conclusion or that

1 interpretation of the significance of 50 per cent
2 cholinesterase inhibition has been put forward.

3 I went on to say that the fact is that
4 there have been many studies done in the field where
5 songbirds showing that level of inhibition and greater
6 have in fact shown no symptoms indicating even distress
7 or sublethal effects.

8 Q. I would like to turn briefly with you
9 to Exhibit 764 which is your paper on fenitrothion
10 avian impact?

11 A. Yes.

12 Q. And at page 7 of that report I'd like
13 to refer you to a particular sentence there at the
14 bottom of page 7:

15 "There remains, however, conclusive field
16 evidence that fenitrothion sprays
17 routinely reduce brain cholinesterase
18 levels in some individuals. The
19 biological significance of these
20 depressions remains an area of question
21 and reasonable concerns over this
22 effect are valid considerations for
23 researchers and regulators alike."

24 Is that still your opinion?

25 A. Yes.

1 Q. So you would not state categorically
2 that the fact that there are cholinesterase reductions
3 of greater than 50 per cent is in fact not evidence
4 that there may be a problem?

5 A. What I'm saying is it's comparable to
6 a physician who measures a clinical symptom but doesn't
7 know what the consequences of that might be.

8 Q. So at this point, do we know what the
9 consequences of 50 per cent or greater cholinesterase
10 reduction might be?

11 A. I've concluded in this paper that
12 because that is not the only way we have looked at
13 effects on bird populations - in fact we have extensive
14 direct evidence of measurements of bird populations -
15 that to place the suggestion that 50 per cent --
16 basically the thesis is 50 per cent inhibition has been
17 measured in the field quite a number of times with
18 fenitrothion, a lab study says -- somebody working from
19 the lab says: This suggests this is life threatening;
20 therefore, we conclude that a lot of birds die, is in
21 fact contrary to the actual data that says that
22 populations of songbirds measured year after year after
23 year in province after province after province under
24 various spray regimes with fenitrothion and aminocarb
25 do not show impacts on the population.

1 And you have to kill birds, it's a
2 contention that you have to, you know, kill a lot of
3 birds to impact on populations.

4 Q. Okay. But you still agree though in
5 the end that the biological significance of this, even
6 though it hasn't shown up in killed birds at this
7 point --

8 A. Or--

9 Q. Behaviourial changes?

10 A. --or inability of songbird
11 populations to reproduce, which in my direct evidence I
12 suggested is more sensitive and perhaps a critical
13 parameter to assess.

14 Q. Well then, why do you state here that
15 it is still a valid area of question; what other
16 impacts could there be?

17 A. I guess I'm saying that the state of
18 our scientific knowledge says that these are valid
19 areas to investigate because we know that, obviously an
20 enzyme that is involved in nerve transmission whose
21 activity has been inhibited presents all kinds of
22 opportunities to suggest pathways by which various
23 lethal or sublethal effects might occur, and I think it
24 is very appropriate that some of those pathways be
25 pursued.

1 However, I think it's inappropriate that
2 this lack of -- you know, the final definitive answer
3 on the biological significance of cholinesterase
4 inhibition be taken at this point to say that we cannot
5 make regulatory and, you know, managerial use decisions
6 with some confidence that we will not be impacting
7 adversely on songbird populations.

8 Q. But would you agree with me that in
9 making that conclusion that you are being more risk
10 taking than you might be if you took a position that
11 said: Well, we don't have all the data yet, we have
12 other alternatives available, let's use those other
13 alternatives?

14 A. We don't have all the data on any of
15 the alternatives. I would say inherently this is a
16 hazard that is probably fairly well defined, it may be
17 much more real than, say, the potential hazard that a
18 virus that we spray is going to somehow become active
19 in a songbird, okay?

20 Now, that latter may be just as unknown a
21 factor. I mean, it's a complicated issue obviously,
22 but I think that there is a tremendous weight of
23 evidence that gives me confidence that we can make
24 those regulatory things without taking a great risk
25 because there is such an unknown quantity to it. It

1 isn't unknown, it's very well defined in the
2 population effects on songbirds, and the
3 question is: Is there a risk to an individual
4 have more trouble defining that than. Is it
5 to a songbird population.

6 I would go that far as to agree
7 with you. I think at the population level
8 taking a big risk when we decide to do it
9 because we know that there's a lot of risk
10 populations will not be adversely affected.

11 Q. When you talk about songbird
12 populations -- I realize this is hard to
13 quantify, but what area or what number
14 about?

15 A. Okay. A forest site
16 between -- okay, we're primarily talking about
17 breeding songbirds. Those are the birds that
18 on forest sites for the propagation of the species.

19 We're dealing with a lot of species.
20 be 80 to 100 species. They can be studied
21 studied on the basis of both the physical and
22 warblers, flycatchers, sparrows, and other
23 at in terms of their habitat preferences.
24 nesters, birds that utilize the ground for
25 have looked at all those parameters.

1 In fact, when we do a census we collect
2 data very often on 50, 70, 80 species of birds. That
3 is not to say the data is going to be as good for each
4 species because some things are harder to study,
5 there's fewer of them, they have bigger territories, et
6 cetera. But I'm confident that; one, knowing what
7 species are likely to be most sensitive; and, secondly,
8 you know, from the data we have on those, that we can
9 make some very broad statements about songbird
10 populations with little risk that we may be safe in
11 saying in about 50 per cent of the birds but there's
12 another 50 per cent it wouldn't apply to.

13 I believe that it applies to the whole
14 range of sensitive forest songbirds breeding in the
15 types of areas that we're talking about using these
16 insecticides in.

17 THE CHAIRMAN: Mr. Kingsbury, apart from
18 doing studies to ascertain the effects of pesticides or
19 insecticides or whatever, would not studies be done on
20 populations of various species of birds in any event to
21 ascertain whether or not any one of these species
22 should be placed on an endangered list?

23 In other words, if any specie of songbird
24 was placed on an endangered list, would that not be at
25 least one of the starting points for trying to

1 determine why?

2 And I guess what I'm getting at is: If
3 no specie of bird has been placed on an endangered
4 list, than the studies that you would normally conduct
5 to determine the components of that list would have
6 come first; would they not, than necessarily going
7 after the cause?

8 MR. KINGSBURY: I think that's a very
9 valid way to look at it. You start with the
10 populations and whether there are individual species
11 that are in danger and then find out why, yes.

12 THE CHAIRMAN: And that hasn't occurred
13 to your knowledge; has it?

14 MR. KINGSBURY: It hasn't occurred. Of
15 course one of the things that's highly unlikely with
16 most species that are adapted to things like the boreal
17 forest is these are species that have very widespread
18 distributions and would only in any year be impacted
19 by -- you know, only a small portion of them would be
20 impacted by things like forest spraying.

21 MS. KLEER: Q. I just have one further
22 question. Going back to the NRCC study at page 24,
23 there is a sentence that says:

24 "For these reasons, the panel suspects
25 that anything other than a major impact

1 might not be detected using current
2 monitoring techniques."

3 Do you agree with that statement?

4 MR. KINGSBURY: A. No, I disagree with
5 that statement in terms of the fact that I think that
6 this has been something that has been thrown out as a
7 bit of red herring by the very people, the Canadian
8 Wildlife Service, who are responsible for measuring
9 songbird populations.

10 I may be off base, but I would suggest
11 that if an agency responsible for ensuring the health
12 of populations of an organism say: Well, you should
13 limit your activities because we can't see any changes
14 in the populations, but our ability to measure those
15 populations are so poor that they may simply reflect
16 the lack of our ability, then it's totally
17 inappropriate to start making management decisions on
18 that basis.

19 I would further, you know, disagree with
20 the assumption that we can't measure songbird
21 populations precisely, because I feel we can, certainly
22 precisely enough to indicate the levels of impact that
23 I believe they are alluding to in that statement.

24 Q. i.e., lower levels than major.

25 A. Yes.

1 Q. Whatever that means. Okay. I would
2 like to deal briefly now with something you said
3 regarding food chain effects. You had stated in your
4 evidence that, in your opinion, in the vast majority of
5 cases there was not a broad enough impact on prey
6 species to significantly impact a predator, and do you
7 still agree with that position?

8 A. Yes.

9 Q. I would like to turn now to a brief
10 review of a publication by Hunter, Witham and Dow.
11 It's a 1984 publication in the Canadian Journal of
12 Zoology.

13 MS. KLEER: (handed)

14 THE CHAIRMAN: Thank you. Exhibit 795.

15 ---EXHIBIT NO. 795: Article entitled: Effects of
16 carbaryl-induced depression in
17 invertebrate abundance on the
18 growth And Behavior of American
19 black duck and mallard ducklings,
20 authored by Malcolm Hunter, Jack
21 Whitham and Hilary Dow, dated
22 1984.

23 MS. KLEER: Q. Now, this journal is a
24 refereed publication; you agree?

25 A. Yes.

26 Q. And the rate of application of
27 carbaryl used here, 840 grams per hectare, we would
28 have the same discussion that we had earlier; correct?

1 A. Correct.

2 Q. Was the method of this study that
3 they followed two groups of ducklings on ponds, one on
4 a spray pond and one on a control pond sprayed with
5 carbaryl. Just summarizing.

6 A. Yes. In fact, what happened is the
7 researcher imprinted these ducklings on them, became
8 their mother and took them out to the ponds every day,
9 the things that researchers do.

10 Q. I was amused by that, no doubt. At
11 page 453 of this report, did the authors conclude that
12 there was a statistically significant decline in growth
13 rate in the ducklings on the sprayed pond that became
14 or began to become evident one to two days after
15 spraying?

16 A. They concluded that the slopes of the
17 regression line slopes -- now, the regression line
18 slopes, just referring you up to 453 to Figure 1 there,
19 you will see on the top line the morning weights and
20 the net weight change from morning is the bottom figure
21 set of lines, of ducklings on these two ponds right
22 through the study period.

23 They are saying that the slope of the top
24 line, the control and experimental line, the slopes of
25 those lines differ significantly, okay.

1 Q. And can you go one step from that and
2 reach the conclusion that there was a significant
3 decline in growth rate in the ducklings on the sprayed
4 pond?

5 A. That there was a difference in the
6 growth rates, yes. I'm not sure whether one could then
7 go and say there is a significant difference in the
8 growth rates. It's -- because really what you're
9 saying is there is a significant difference in the rate
10 of growth.

11 Now, one of the things that comes into
12 play here is the relative changes related to the weight
13 of the animals, so -- I'm getting into semantics and I
14 would basically agree with what you're saying.

15 Q. All right.

16 A. I think though if you -- I would just
17 point out to the Board, if you look at the bottom sets
18 of lines, okay, that are talking about net weight
19 changes from morning to morning, okay, you will see
20 some -- a variation there in what's happening on those
21 two ponds that again says to me, you know, there are
22 some other things that come into play.

23 Q. But certainly with respect to the top
24 portion of the graph dealing with morning weights,
25 there was a clear increase in the controls as compared

1 to the experimentals?

2 A. Yes.

3 Q. Did the authors also conclude that on
4 the sprayed pond the biomass of and the actual numbers
5 of aquatic invertebrates were significantly less
6 following spraying as compared to the control pond?

7 A. Yes, they did.

8 Q. Would you agree that the authors
9 found that there was a strong indication that the
10 changes in the growth rate were due to spraying by
11 carbaryl, and that's I believe at page 454 in their
12 discussion where it says:

13 "We have found a decline in the
14 growth rate and changes in the behavior
15 of ducklings and these strongly indicate
16 that spraying ponds with carbaryl
17 significantly reduces the amount of
18 invertebrate food available for
19 ducklings."

20 A. I would agree that -- with what they
21 say when they say strongly indicate, and I think in
22 saying strongly indicate they've captured some of what
23 I've alluded to as, we've gone from statistical
24 significance in rates of growth on these lines to what
25 I suspect these authors themselves are unable to say,

1 that there is a statistically significant change; they
2 say it strongly indicates.

3 Once again, I think they've lost their
4 statistical significance; however, whatever weight you
5 want to give to that in going to this point, and
6 certainly it's a valid thesis and a very difficult kind
7 of study to perform, as you can imagine. They have
8 gone to a certain extent to produce some evidence
9 supporting...

10 Q. Well then, I would like to go back
11 then to your opinion that you stated earlier about the
12 vast majority of cases it's not a broad enough impact
13 on prey species to significantly impact a predator.

14 Would you agree that this study at least
15 constitutes some evidence of such an effect,
16 prey/predator relationships?

17 A. Well, first of all, the fact that
18 this is taking place in an experimentally oversprayed
19 pond situation, it's not something that has happened,
20 okay--

21 Q. To your knowledge?

22 A. --to my knowledge in Ontario, okay,
23 because this material; one, has had a very limited use
24 pattern, hasn't been used for quite a number of years
25 and hasn't been oversprayed on these types of ponds. I

1 can say that I believe with some certainty.

2 Secondly, the question of whether the
3 indication that they have shown that strongly indicate
4 spraying the ponds reduced the invertebrate food
5 available for ducklings and led to a change in growth
6 rate does not necessarily indicate that these ducklings
7 would not have in fact -- certainly in natural
8 situations - perhaps even if they were confined to
9 these ponds until the time that they could fly, which
10 might not be the case - may not have still been able to
11 reach a point of maturing and been able to migrate
12 south and carry on their life cycle and their
13 reproductive effects. They might have been smaller
14 initially.

15 MS. MURPHY: I wonder -- just for my
16 assistance, I'm having a little trouble with my notes
17 and can my friend just go back and again read the
18 comment that she is attributing to Mr. Kingsbury in the
19 first place, because I only have the first little bit
20 of it.

21 MS. KLEER: All right. I'm happy to do
22 that. I believe I had stated that it was Mr.
23 Kingsbury's evidence that in his opinion in the vast
24 majority of cases there was not a broad enough impact
25 on prey species to significantly impact a predator.

1 MR. KINGSBURY: Okay.

2 MS. KLEER: Q. Well, you agree with me
3 though that it's pretty difficult to study--

4 MR. KINGSBURY: A. Yes.

5 Q. --this sort of impact in a natural
6 situation?

7 A. Certainly it is, and one of the
8 reasons that it is difficult is because the -- you
9 know, I can certainly testify that the response of an
10 invertebrate community and of these very invertebrate
11 communities where definitely there is evidence that
12 some species are suppressed in these instances for long
13 periods of time.

14 There is, however, in the same studies
15 evidence that other species have in fact increased,
16 which is very much a part of what happens in nature,
17 you know, you -- and that, as I indicated in my direct
18 evidence, be able to measure these things clearly and
19 cut and dry is partly made difficult by the
20 compensatory mechanisms there, that these ducklings may
21 in fact had a lot more chironomids to feed on after the
22 impact than they had amphipods and that that, perhaps
23 not completely but partially compensated for their
24 ability to obtain sufficient food.

25 Q. But you are speculating at this

1 point; you don't know if they would have turned to
2 chironomids?

3 A. I'm speculating with respect to this
4 study with ducklings, but there is hard evidence for
5 that where other predators and their utilization of
6 prey after spray impacts have been evaluated.

7 So in the context of your larger
8 statement of what I said was a generalization; no, I'm
9 not speculating totally on that because there is in
10 fact evidence of that.

11 Some excellent evidence, for instance,
12 coming from early DDT sprays that had very dramatic and
13 long-term impacts on many kinds of aquatic
14 invertebrates showing the ability of things like
15 Atlantic salmon populations to both utilize and thrive
16 on the invertebrates that filled the niche of the
17 organisms that were taken out.

18 Q. But would you state that those kind
19 of changes are something that we want to happen or they
20 simply happen in some instances?

21 I guess what I'm getting at is: Do we
22 wish to maintain the status quo as far as possible, or
23 are we simply going to say: Well, spray and the
24 population will change?

25 A. I'm simply saying that, you know, as

1 has been pointed out before, many of the organisms that
2 are adapted to this system, particularly the boreal
3 forest, are very adaptable to catastrophic changes in
4 things like habitat, so that they are adapted to wild
5 fires and budworm outbreaks. I'm not saying that's
6 good or bad, I'm saying that there are compensatory
7 mechanisms.

8 I would, however, go back and say: This
9 situation is an easily avoidable situation in that it's
10 an experimentally contrived direct overspray of an
11 aquatic system which is known to enhance the potential
12 for carbaryl residues to persist and have biological
13 effects in invertebrates.

14 Q. But would you agree with me that even
15 in the presence of buffer zones, which I think is what
16 you're getting at, or with the existence of buffer
17 zones, we don't have any guarantees that we're going to
18 catch every small pond?

19 In fact, do buffer zones even apply to
20 small acidic ponds that may not be visual -- or may not
21 be able to be seen from the aircraft?

22 A. I would agree, but I would also say
23 that certainly it is very much within our capability to
24 identify significant duck-producing areas and avoid
25 introducing carbaryl into them.

1 Q. All right. I will leave this area
2 now.

3 MS. KLEER: I have a brief section on
4 honey bee colonies and then I would suggest that my
5 next blocks could be dealt with after the break, if
6 that's all right.

7 THE CHAIRMAN: Very well.

8 MS. KLEER: Q. Now, at page 60 of the
9 ESSA Document--

10 MR. KINGSBURY: A. Yes.

11 Q. --I believe it was your evidence
12 indicated there that fenitrothion has been associated
13 with the death of honey bees; is that correct?

14 A. Are we coming -- you are referring to
15 fenitrothion or carbaryl here?

16 Q. Sorry. I guess I am referring to
17 carbaryl not fenitrothion, however, you say it.

18 A. Fenitrothion, the F chemical.

19 Q. I will use that from now on. So you
20 agree then with respect to carbaryl, or the C chemical,
21 that death of honey bees is one of the effects that
22 occurs with this in regular applications?

23 A. In which...?

24 Q. In regular forestry applications?

25 A. No, I wouldn't agree with that, in

1 terms of when it says:

2 "Historically, carbaryl has been
3 associated with the demise of entire
4 colonies of honey bees and other
5 pollinators..."

6 I would suggest that a large part of that
7 historical association is from agricultural use
8 patterns.

9 Q. Has there not though been evidence in
10 forestry applications of this same effect?

11 A. With honey bees and carbaryl?

12 Q. Yes.

13 A. I am not aware of very much evidence
14 on this topic simply because; one, very little has been
15 generated in Canada because of the lack of a forestry
16 use pattern for carbaryl and in Maine most of the
17 studies have concentrated on wild bees.

18 So, again, with honey bees, I think in
19 Maine the studies have moved beyond that into wild
20 bees.

21 Q. Well, may we turn then for a brief
22 moment to the wild bee studies.

23 A. Yes.

24 Q. What effects has carbaryl had on wild
25 bee populations in Maine?

1 A. Carbaryl has certainly been shown to
2 be capable of impacting on some wild bees. It's
3 certainly, as I indicated in my direct evidence, a very
4 difficult and complex area to study.

5 Now, I would suggest that we have better
6 and more current information regarding fenitrothion and
7 aminocarb in Canada than might be available on
8 carbaryl. However, with carbaryl one of the
9 considerations is that a manufacturer has also
10 reformulated to produce commercial products which
11 reduce bee toxicity of carbaryl products.

12 Q. I would like to clarify that. When
13 you say reducing bee toxicity, is that only because --
14 well, is that reduction of toxicity on a population or
15 a colony level; i.e., because the new formulation deals
16 with the ability to transport the insecticide back to
17 the hive?

18 A. Well, I believe that there is
19 evidence that it's partially a reduction in toxicity to
20 individuals as well as an observed reduction to limit
21 toxicity to populations.

22 Now, one of the things that -- I am just
23 trying to think of whether I have the actual evidence
24 with me at the moment, but we have done toxicity
25 studies with carbaryl on a variety of bee species and

1 one of the indications from that is that carbaryl, in
2 fact, has a wide range of toxicities when you go from
3 species to species.

4 As a for instance, although honey --
5 although bumble bees are quite -- show a narrow range
6 of sensitivity -- okay, although fenitrothion shows a
7 very narrow range in terms of the amounts needed to
8 kill a honey bee versus a bumble bee; with carbaryl,
9 when you go from a honey bee to a bumble bee, the
10 amount required to kill a bumble bee is much, much
11 greater relative to the difference with fenitrothion.

12 So that there is evidence that has been
13 generated - and this is also supported by the fact that
14 for aminocarb, which being a carbamate is a little
15 closer to carbaryl - that there is evidence suggesting
16 carbamates themselves may show more variability in
17 terms of their potential to pose hazard when you get
18 into a wider range of wild bee species. That, of
19 course, would suggest that their impacts might be more
20 limited.

21 Q. But then on the upper range of that
22 range of species of wild bees then there may, in fact,
23 be quite high negative degree of impact; is that a fair
24 statement?

25 A. That's right. And certainly it's --

1 we know that for carbamates in particular that the
2 exposure route and pathway is very important, that
3 aminocarb if sprayed and bees are out actively foraging
4 can impact fairly significantly. But, in general, if
5 that kind of exposure is avoided by spraying before
6 bees are actively foraging, there seems to be very
7 little toxicity exerted through environmental residues
8 themselves aside from residues in the air at the time
9 of spraying.

10 Q. Well, maybe this isn't a question you
11 can answer, but before someone in a forestry situation
12 goes to spray, are they going to be looking at whether
13 or not bees are out foraging?

14 A. It is in fact captured by the
15 meteorological conditions that are required. And I
16 might just indicate the instance in which we, in a
17 direct field study, observed heavy mortality from
18 carbaryl spraying took place in a massive spray
19 operation in Quebec in the mid-70s when they were
20 spraying at two o'clock. That is not normal
21 operational practice, in fact, I don't think you would
22 see that, you know, this is in bright, hot sunny
23 weather.

24 I think - and I could be corrected on
25 this - but I suspect you would find in the Ministry

1 guidelines that spraying under such conditions would
2 not be permitted.

3 THE CHAIRMAN: So are you saying that
4 spraying would only be allowed at times when bees would
5 essentially not be foraging?

6 MR. KINGSBURY: Spraying tends to be
7 limited to times of the day which are -- when they are
8 less likely to be.

9 MS. KLEER: Q. I just want to be clear.
10 You don't really -- you are not qualified to give
11 evidence on when they are actually spraying, because
12 you are not totally familiar with that; is that a fair
13 statement?

14 MS. MURPHY: My friend did ask him the
15 question.

16 MS. KLEER: I know, I recognize that now,
17 and I just want to clarify that we really don't have
18 any evidence at this point.

19 MS. MURPHY: That is also inaccurate.
20 This evidence has been given in this panel, Mr.
21 Nicholson has gone through all the Ministry guidelines.
22 If my friend is interested in going back into the old
23 evidence, I'll try and be particular about that later.

24 MS. KLEER: I will just make one point.

25 Q. What is the peak time for foraging

1 for bees?

2 MR. KINGSBURY: A. The peak time depends
3 on the species. Certainly for something like a honey
4 bee and many species of small wild bees, the more
5 sensitive species, it would be the warmer, warmer
6 periods of the day which would tend to be around noon,
7 and that tends to be not the time when insecticide
8 spraying takes place, it's in fact the time when one
9 would tend not to spray because warm temperatures and
10 upcurrents associated with them are more likely to
11 reduce the deposit of your material.

12 Q. Are there some species that forage
13 earlier in the day?

14 A. Yes. The bumble bee is a specific
15 example that is biologically adapted to forage earlier
16 in the day. It still is not a species that is commonly
17 encountered out foraging in the forest until you get to
18 eight, nine o'clock in most instances.

19 Q. And are you aware of any other wild
20 bee species that forage early in the morning in
21 forests?

22 A. No. In fact, the bumble bee is
23 rather unique in terms of its physiology. The vast
24 majority of bees would not have the capability to
25 become actively mobile under cooler conditions.

1 Q. Okay. I would like to have one
2 further question with respect to the new formulation
3 of -- newer formulations of carbaryl. I believe at
4 page 60 it's indicated that the newer formulations are
5 designed so that it's less likely that a foraging
6 insect will transport the insecticide back to the hive.
7 And I am wondering if you know of any studies that
8 verify that statement?

9 A. Yes, there are studies done in
10 agricultural situations not in forestry situations.

11 MS. KLEER: Okay. I will end here for
12 now.

13 THE CHAIRMAN: Can you give us an
14 indication, Ms. Kleer, where you are in your
15 cross-examination?

16 MS. KLEER: I imagine I will take three
17 to four more hours.

18 THE CHAIRMAN: Very well. Okay. We will
19 take an hour for lunch, return at a quarter to two.

20 Thank you.

21 ---Luncheon recess taken at 12:45 p.m.

22 ---On resuming at 1:50 p.m.

23 THE CHAIRMAN: Thank you. Be seated,
24 please.

25 MS. KLEER: Good afternoon.

1 Q. Okay. I would like to turn now to
2 some statements that are in the ESSA Document and I
3 will ask you some particular questions with respect to
4 them.

5 First, if we could turn to page 71 and
6 the bottom paragraph. There it states:

7 "While little direct evidence exists to
8 document the presence or absence of
9 indirect effects of herbicide use on
10 terrestrial animals, it is nevertheless
11 worth examining the ways in which the
12 various groups of animals of interest
13 here might be affected."

14 And I would like to focus just on the
15 first part of that sentence. Do you agree that there
16 is little direct evidence to document the presence or
17 absence of indirect effects of herbicide use on
18 terrestrial animals?

19 MR. KINGSBURY: A. Certainly it's a
20 fairly limited body of knowledge. The other thing is
21 it's a more scattered body of knowledge than might be
22 the case in many of the things we are discussing, in
23 that it may encompass a wide range of possible sources
24 where people have looked at animal populations and part
25 of the study would be the fact that a portion of their

1 habitat has been modified.

2 Now, sometimes it may not be a
3 modification that has been by a forestry herbicide but
4 there might be, say, a modification that reduces food
5 availability and that might be something that in a way
6 can be applied to the situation.

7 One of the key questions in this area, of
8 course, is a biological question of: What are the
9 habitat requirements and how much can an organism --
10 does it need or how much can it do without. But I
11 think that certainly there is not a great number of
12 studies that have followed animal populations after
13 their habitats have been modified by forestry herbicide
14 applications.

15 Q. Okay. I would like to turn to page
16 58.

17 A. Yes.

18 Q. Do you agree that the effect of
19 aminocarb on reptiles and amphibians is uncertain
20 because virtually no studies have been carried out on
21 this aspect of aminocarb toxicity?

22 A. I believe the authors -- the group
23 that participated in the exercise missed a number of
24 studies here. There was a study done in the Province
25 of Quebec using a sand transect method with a seasonal

1 maximum application of aminocarb that evaluated the
2 activity via the tracks of toads and frogs before and
3 after, in fact for a year prior and a year after spray
4 application, and there also have been some studies done
5 on toxicity to larval stages, to tadpoles.

6 Q. Are those the only studies that you
7 are aware of with respect to amphibians and reptiles?

8 A. There are a number of older studies
9 that are reviewed in the Prebble Document dated 1973.
10 I am not sure, you know, how many of them refer to
11 aminocarb specifically. They were carried out in the
12 spray program in New Brunswick quite a while ago and I
13 would have to look at them again.

14 Q. So even if you put all those
15 together, which would appear to be three or four
16 studies, would you say that there are little studies
17 and, in fact, there are other -- a lot of other groups
18 of reptiles and amphibians that have not yet been
19 studied?

20 A. That's true. They tend to be
21 organisms that are difficult to study and in low
22 numbers in many of the kind of forestry situations we
23 are talking about. Snakes are particularly difficult
24 to study population-wise anyways.

25 Q. Okay. If we could turn to page 59.

1 The paragraph -- the second full paragraph where it
2 says:

3 "There is little, if any,
4 documentation of evidence on the effect
5 of carbaryl on raptors."

6 Is that also your impression or your
7 opinion?

8 A. That's correct. Raptors as a group,
9 of course they have very large territories, they tend
10 to nest in rather difficult sites to get to. As a
11 group raptors have not generally been studied in the
12 context of forestry pesticide programs; one, because
13 they are difficult to study; secondly, they aren't
14 considered to be likely to be terribly susceptible to
15 either direct or indirect effects in many instances
16 because of the size of their breeding and feeding
17 territories, the large size of themselves -- of the
18 birds.

19 It's felt to be much more suitable to
20 look at smaller organisms considered more sensitive.

21 Q. While they are considered more
22 sensitive, do you have any evidence to say that they
23 are -- that raptors in fact might not be as sensitive
24 as smaller animals, or is that just a general
25 principle?

1 A. Toxicologically? In terms of saying
2 that toxicologically they are the less sensitive?

3 Q. Yes.

4 A. Yes, there is some evidence of actual
5 toxicity studies done. Naturally one doesn't go
6 about--

7 Q. Killing raptors.

8 A. --killing raptors for the basis of
9 toxicity studies.

10 Q. So what are you saying then, that
11 toxicity studies have been done on raptors or haven't
12 they been done?

13 A. Limited and also toxicity studies
14 that would be using what I might call surrogates for
15 raptors in terms of -- well, as a for instance, one can
16 argue that a chicken is a better model of a hawk than a
17 warbler, and if we can extrapolate from that kind of
18 studies it would indicate that the warbler
19 toxicologically is more sensitive than the hawk is
20 likely to be.

21 Again, often these kinds of studies are
22 limited simply because one doesn't make a point of
23 going out and taking a hundred hawks and subjecting
24 them to a pesticide treatment to see how much it takes
25 to kill them.

1 Q. So are there any published studies
2 then on the effects of pesticides on raptors that you
3 are aware of?

4 A. There certainly are -- there is not a
5 body of literature dealing specifically and directly
6 with it. We would routinely survey raptors in our
7 population studies.

8 Q. But not with respect to pesticide
9 effects?

10 A. With respect to following their
11 population in a sprayed area, but because of on a
12 10-hectare plot you may encompass a portion of the area
13 of one raptor's breeding territory, and sometimes we
14 have a nesting site within a study block, but that's
15 obviously a very small sample size to draw general
16 conclusions from.

17 Q. All right. Then turning to page 60,
18 I think we talked earlier about aminocarb studies on
19 reptiles and amphibians. Do you agree that there is
20 also little published information about carbaryl
21 effects on reptiles and amphibians?

22 A. Yes.

23 Q. And would the same apply to
24 fenitrothion or the F chemical?

25 A. There is a little bit more available

1 on fenitrothion. Again, if you will look on page 62
2 you will see some work that has been reviewed on
3 fenitrothion there.

4 One of these, Lyons, et al, is a field
5 study carried out in forestry situations actually done
6 within our research group that looked fairly
7 intensively at both larval and adult frogs and toads in
8 terms of their response to fenitrothion treatments.

9 Q. Would you agree that there are other
10 species of toads, and as you stated with respect to
11 bumble bees, the effect -- or rather not bumble bees,
12 but bees in general, that the effect on different
13 species might in fact be different with respect to
14 amphibians as well?

15 A. Oh, yes.

16 Q. Okay. Would you agree with me then
17 that as a general proposition there are some animal
18 groups and a fair number of animal groups in fact where
19 the effects of pesticides have not been studied at all
20 or to such a limited extent that no conclusions can be
21 drawn with respect to their impacts?

22 A. In my direct evidence I talked about
23 why we basically choose selected organisms and selected
24 parameters of those organisms to indicate and base --
25 make -- do decision-making on the basis of the longer a

1 material is in use the more extensive the use pattern.

2 It's true that more and more
3 environmental components in terms of animal groups or
4 ecological processes are evaluated. You can target on
5 things like amphibians, but the reality is that there
6 is such a wide range of animals present in the forest
7 eco-system, not to mention the plants, it's impossible
8 to study each and every one.

9 Again, we go back to basic biological
10 knowledge that points us towards the most appropriate
11 things to study and, for a number of reasons that I
12 spelled out, that make them appropriate.

13 Q. Well, are reptiles and amphibians
14 appropriate things to study?

15 A. They certainly have ecological value,
16 they have other values that people and other organisms
17 place upon them. They are difficult to study, that is
18 one of the reasons we tend not to study them, and if we
19 could study each and every thing so much the better.
20 Obviously that is impossible.

21 Q. And the same is true with respect to
22 raptors, that they are ecologically important?

23 A. Yes.

24 Q. And also difficult to study?

25 A. One of the things about things like

1 the raptors is that there is an ability indirectly to
2 because their populations are looked at in a
3 generalized sense; when, as the Chairman indicated, you
4 get into things like we see a decline in something like
5 a raptor species, we start to look for the effects.

6 So there is there, if you want to call
7 it, a mechanism whereas a red flag could be waved if
8 there was a significant impact taking place on that
9 population that would indicate a need to perhaps
10 evaluate forestry practices or pesticide use as a
11 possible cause of what is happening to that raptor
12 population.

13 Q. Are you yourself involved at all with
14 raptor censusing?

15 A. Only in the most indirect of ways.
16 Our group has sort of contributed to some censusing
17 activities simply in the course of doing our pesticide
18 specific census work.

19 Q. So do you know yourself whether or
20 not raptor censusing has indicated that there may be a
21 red flag at this point in time?

22 A. Well, certainly for DDT usage that
23 was a red flag that was waved and there is a rather
24 extensive body of literature that relates to
25 contaminants and things like raptors and ducks and

1 seabirds, et cetera.

2 Now, in general, that body of knowledge
3 has not dealt with the materials we are talking about
4 in the context of this undertaking, partly because
5 there has been very little indication that they are a
6 major concern.

7 DDT was the exception and raptor
8 populations have been followed in some places fairly
9 closely since the cessation of DDT spraying and have
10 been shown to show a fair bit of recovery.

11 Q. Perhaps you can help me. How long
12 has carbaryl been in use or how long was carbaryl in
13 use in Ontario before it was taken out of use. Do you
14 have any idea?

15 A. Yes, I have some fairly specific
16 information that I was looking at earlier today. It
17 indicated that in Ontario I think there was only one
18 use, which was a matter of a few hundred hectares for I
19 believe oak leaf shredder up to 1975.

20 I know that there was a very modest use
21 in the early years of gypsy moth and I suspect that,
22 aside from that, not a lot -- I doubt very much that
23 carbaryl use in the province even over three decades
24 when it's been available has been much size at all,
25 referring now to forest spraying carried out by the

1 Ministry.

2 Q. So would you agree then that the
3 length of usage of carbaryl at any rate may not have
4 given rise to any effects yet that could be detected
5 through censusing techniques; is that reasonable?

6 A. In Ontario. I would, however, state
7 that very much to the contrary in the State of Maine
8 there was an extensive use pattern of carbaryl which I
9 suggest probably encompassed some 10 to 15 years of
10 annual treatments, sometimes running up into the
11 hundreds of thousands or even millions of acres and
12 that there was a very active monitoring program in
13 place in that state from which most of the data on
14 forestry impacts of carbaryl have evolved.

15 Q. And did that monitoring data deal
16 with raptors, as far as you are aware?

17 A. I know that there was some attempt to
18 address raptors in some of that monitoring, but I
19 wouldn't -- I am not aware of any specific studies
20 focusing on raptors in particular. There certainly
21 wasn't a continuing production of studies such as we
22 saw, for instance, with carbaryl on aquatic
23 invertebrates.

24 Q. Okay. I would like now to turn to a
25 few other points that are raised in the ESSA Document

1 and determine, again, whether you agree with these
2 particular points. And you may not have reviewed the
3 study, in which case we will just pass over it.

4 At page 58 there is reference to a study
5 by Bendell, et al 1986 dealing with pitfall catches of
6 wood frogs.

7 A. Yes.

8 Q. Are you familiar with that study?

9 A. Yes.

10 Q. Do you agree with me that that study
11 afforded some evidence with respect to aminocarb and
12 fenitrothion that there may be toxic effects on wood
13 frogs from these two insecticides?

14 A. No. I feel that that study is very
15 inappropriate to draw that conclusion from. The data
16 in that study, if I might summarize it, basically deals
17 with very small catches on all treatment plots
18 pre-spray and on the control plot a rather large catch,
19 in terms of several hundred individuals that isn't
20 reflected in the other plots.

21 It might be appropriate to have that data
22 before the Board so that they can verify what I'm
23 saying about it.

24 But, first, I don't think that pitfall
25 catches in themselves are a very good way to census

1 frog or toad populations; and, secondly, I think that
2 the conclusions drawn from that - and I believe I
3 pointed this out in my direct evidence - to me far
4 overemphasize the database on which they are supported.

5 The fact is that for aminocarb, the study
6 done in Quebec with the sand transect work does in fact
7 to me present a much more substantial database on which
8 to draw conclusions and it wouldn't support those
9 conclusions for aminocarb.

10 Q. With respect to carbaryl, are you
11 aware of any similar studies?

12 A. No.

13 Q. Okay. I would like to turn to page
14 61 which refers to a study by Buckner and McLeod?

15 A. Buckner and McLeod.

16 Q. Sorry, Buckner. And actually it
17 wasn't Buckner and McLeod, I meant Buckner, et al, in
18 1977 where they recorded:

19 "Breeding interruptions in several
20 species of small mammals under simulated
21 spray regimes of fenitrothion at current
22 application rates for spruce budworm."

23 Now, did you -- or do you agree with the
24 findings of that study?

25 A. That study was a laboratory study

1 carried out by the institute in Ottawa where I started
2 my career and what that study did is exposed, in the
3 lab, small mammal populations to the nominal applied
4 dosage rates of fenitrothion at various -- one times,
5 two times, three times, five times that rate and then
6 followed the breeding success of those animals in the
7 lab. Okay.

8 Q. Well, all right. In a laboratory
9 context, which at least they were able to control some
10 of the factors in that lab context, do you agree that
11 at least in the laboratory context it showed breeding
12 interruptions?

13 A. I think -- I know that there were
14 suggestions that breeding success was lower at the
15 higher rate studied. It is my belief initially that
16 those were higher than the operational -- nominal
17 operational rate. However, I would suggest that they
18 represented a significantly higher exposure than what
19 we would find with small mammals out in a forest
20 environment, because this is directly applying the
21 material in the lab to the animals as opposed to having
22 them encounter it on the forest floor under mature
23 conifer canopy where they would certainly get a lot
24 less of the material -- an exposure.

25 Q. I guess we are left with the problem

1 though, as you have indicated earlier, it is difficult
2 to study them in the wild, so that lab studies do
3 afford some evidence although they might not be as good
4 evidence as you'd get if you did a field study; is that
5 correct?

6 A. That's correct. Well, I guess it's
7 perhaps not as applicable as a study from a field
8 study. On the other hand, it is more controlled. If
9 you take note on the next page it says:

10 "A summary of Buckner's studies in the
11 NRC report noted applications of
12 fenitrothion at 688 grams per hectare..."
13 Which is about three times higher than
14 the application rate of 210 grams per hectare:

15 "...produced lung lesions and deaths."

16 I might suggest that we may be beginning
17 to encounter a situation here that is somewhat akin to
18 taking studies of humans who have ingested pesticide
19 and trying to draw conclusions about what the effects
20 on bystanders from a spray operation might be.

21 When you get down to lung lesions, you're
22 probably talking about a rather substantial exposure to
23 concentrated material that, you know, I would suggest
24 is related to the fact you've sprayed them with a lot
25 of material in the lab.

1 Q. All right. If we could turn to page
2 64.

3 MS. MURPHY: Just for the purposes of the
4 record, if I might. If I might just remind you that
5 the specific information about the use, for example, of
6 carbaryl in Ontario in specific years, amounts and so
7 forth in which it was used can be found in Exhibit 659
8 to 661 where it was previously filed.

9 THE CHAIRMAN: Thank you.

10 MS. KLEER: Thank you.

11 Q. All right. We're at page 64.

12 MR. KINGSBURY: A. Yes.

13 Q. I believe it is stated there that
14 after spraying with chemical insecticides it's
15 reasonable to expect that there would be some adverse
16 effect of food availability to fur bearers, and I would
17 question you as to whether you agree that that's a
18 reasonable hypothesis?

19 A. Could you please repeat that?

20 Q. Well, on page 64 in the section that
21 begins -- or that is headed up with: Insecticides.

22 A. Yes.

23 Q. It states:

24 "Fur bearers eat small mammals..." et
25 cetera, and then:

1 "...based on the evidence presented
2 above, Link 2, all of these groups and
3 especially insects may be affected to
4 some extent by insecticide use and, thus,
5 some adverse effect of food availability
6 to fur bearers is a reasonable
7 expectation."

8 Would you agree with that?

9 A. I would suggest that the emphasis
10 there should be on insects and insectivorous fur
11 bearers. By far and away the greatest effect on fur
12 bearer food supplies will be through impacts on
13 insects.

14 Q. On page 72 there is a suggestion of a
15 link made between red fox and lynx populations and
16 herbicide application. It states in the second full
17 paragraph:

18 "In the event that herbicides were
19 applied to such older stands and reduced
20 herbaceous ground cover, shrubs and
21 saplings that provide both food and cover
22 for heron, grouse, then presumably lynx
23 and red fox populations could be
24 reduced."

25 Would you agree that that's a reasonable

1 hypothesis?

2 A. Certainly. You know, the changes in
3 the vegetative cover that affect prey species will
4 affect their predators as well.

5 Q. And then turning to page 78 --

6 THE CHAIRMAN: But again, Mr. Kingsbury,
7 would you not ascertain whether or not there is an
8 effect by measuring the population itself? Would that
9 be the way you would determine whether there is
10 something you should be concerned about?

11 MR. KINGSBURY: Well, in some situations,
12 Mr. Chairman, you would simply be recognizing the fact
13 that the habitat changes the herbicide might induce
14 will change the habitat qualities just as letting the
15 forest grow up might.

16 For example, red fox may in fact be
17 limited simply because a forest matures, not only
18 because you spray a herbicide and make it unsuitable.

19 Of course, the difference with the
20 herbicide is it's probably going to go through another
21 stage when it may again be more suitable for red fox,
22 so you're changing succession.

23 THE CHAIRMAN: But the confirmation of
24 that would be taking in some kind of census of the
25 animal itself and determining whether or not there is a

1 population difficulty?

2 MR. KINGSBURY: That's true, although the
3 reality with things like fur bearers is it's -- with
4 the size of most herbicide treatments, it's difficult
5 to do a population study on things like red fox. You
6 can do it, on the other hand, on things like mice and
7 voles that are far more abundant in a smaller area.

8 MS. KLEER: Q. Okay. I would like to go
9 to page 78 and I think there is a suggested link made
10 there between local effects of herbicides on
11 invertebrates and local effects on other terrestrial
12 species, and that's put forward as a plausible linkage.
13 Is that, in your opinion, a plausible linkage?

14 MR. KINGSBURY: A. Is this in the middle
15 section there under Invertebrates--

16 Q. Yes.

17 A. --the last sentence?

18 Q. Yes.

19 A. I think that's plausible, recognizing
20 the scale; it's on a local scale. Again, it may --
21 it's most plausible for those organisms with a limited
22 range and utilizing a small area.

23 Q. All right. I'm not going to deal
24 with the ESSA Document any more, I think. I would like
25 to turn now to Exhibit 712?

1 A. Which is...?

2 Q. That's Pesticides in Forestry and
3 Agriculture where your Carnation Creek experiment was
4 dealt with, and I would like to specifically look at
5 pages 275 to 276.

6 Now, this is taken from an article -- or
7 not an article, a portion written by Mr. Ernst, I
8 believe.

9 A. That's correct.

10 Q. And that section is entitled:
11 Assessing and Regulating the Environmental Effects of
12 Pesticide Use, which begins at page 272 of the
13 document, just for the Board's reference and everyone
14 else.

15 Now, Mr. Ernst was with the Environmental
16 Protection Service for Environment Canada when he wrote
17 this?

18 A. Yes, the Atlantic region.

19 Q. And does he have experience or
20 knowledge with -- or knowledge of, rather, the types of
21 evaluations of pesticides that are done following
22 registration?

23 A. He's not directly involved with the
24 regulation of pesticides in Canada.

25 Q. No, I'm talking about: Does he have

1 knowledge with -- sorry, knowledge of evaluations that
2 are done following registration?

3 A. Following registration?

4 Q. Yes.

5 A. In terms of impact studies done; yes,
6 he has conducted a number of impact studies,
7 post-registration impact studies.

8 Q. I would like to turn to page 276 and
9 read to you a statement contained there. It states at
10 the bottom paragraph:

11 "Unfortunately, there are few
12 investigators in Canada who are now
13 monitoring field impacts of pesticides.
14 Almost all of these are government
15 scientists in environmental and resource
16 agencies and it has been estimated by
17 Environment Canada in 1984 that in 1984,
18 within Environmental Canada, with a total
19 staff of over 10, 000 people, there were
20 only 16 person years dedicated to
21 assessing pesticide use after
22 registration."

23 Do you have any problems with those
24 figures. Would you accept those figures?

25 A. I suspect that they are fairly

1 indicative of the situation given that Environment
2 Canada, the federal environment agency, while I was a
3 member of it, more or less advised that it was
4 primarily a user's responsibility, once a material had
5 been approved and registered and through the federal
6 process, to evaluate pesticides.

7 I think that in some areas there is
8 perhaps a shift away from that in things like looking
9 at more widespread monitoring programs tend to be
10 contaminant related, and I think if one encompassed in
11 that things like what I was alluding to, say, with
12 endangered species with raptors, where people are
13 looking at populations and one of things they may
14 indirectly be monitoring is negative impacts of all
15 sorts of things, including forestry pesticide use, but
16 then the number would be considerably higher than the
17 16. However, they aren't going out specifically
18 looking at pesticide impact studies.

19 Q. To your knowledge is it still
20 Environment Canada's position that it's the user's
21 responsibility to do these types of impact studies?

22 A. I'm not sure whether there has been a
23 policy statement from Environment Canada on that.

24 Q. Thank you.

25 A. I know that, again, Environment

1 Canada has been a very dynamic organization. For
2 example, at this time the Canadian Forestry Service and
3 my group would have been part of it, and we strongly
4 resisted that and, in fact, have throughout our
5 existence inside and more recently outside of
6 Environment Canada considered it contingent to carry on
7 post-registration studies.

8 Q. Would you agree with me that relative
9 to the amount of study that is done on pesticides prior
10 to registration in order that they might be registered,
11 that the level or the degree of monitoring that's done
12 on environmental effects in the field is substantially
13 less?

14 A. I would like to put that question in
15 a historical context. Certainly in the 70s we probably
16 did far more post-registration studies. That reflected
17 the fact that there had been a less rigorous
18 requirement for studies at the time of registration for
19 some of the older materials.

20 Now there appears to be a more rigorous
21 preregistration requirement and -- but I would go on to
22 suggest that, particularly in forestry where the
23 turnover of chemicals has been very small, that that
24 is -- it's still the case when we look at the majority
25 of materials available such as BT, fenitrothion,

1 aminocarb and carbaryl, they have all certainly been
2 studied far more post-registration.

3 The fact is there haven't been very many
4 new materials come along such as glyphosate that have
5 been newly registered, had a lot of preregistration
6 requirements and where we've, more or less, had a
7 history to see what kind of research has been ongoing
8 afterwards.

9 The fact that we are looking at things
10 like moose browse impact, et cetera, still suggests to
11 me there is always going to be that interest in and
12 fairly active involvement in post-registration
13 monitoring.

14 Q. On page 277 at the top, Mr. Ernst
15 suggests that looking at the numbers of persons who are
16 involved with environmental fate and effects
17 monitoring, that this indicates an inadequate
18 dedication of resources to the issue. Would you agree
19 with that statement?

20 A. I would suggest that where the facts
21 and figures he has presented relate to pesticide work
22 done within Environment Canada, it's strongly
23 influenced by the fact that he is one of those few
24 people in fields that, within his agency, they should
25 be doing more of that work.

1 In most -- many jurisdictions the fact
2 that very little work has been done recently reflects
3 the use patterns. For example, in Ontario the only
4 work done recently has been done on BT with respect to
5 insecticide work because that's been the only material
6 sprayed. There continues to be, however, ongoing
7 post-registration evaluation studies with BT. They are
8 perhaps more limited because the use pattern is more
9 limited and the concerns with the material may be more
10 limited.

11 I would point out that with things like
12 fenitrothion, in the mid 70s the Department of
13 Fisheries and Oceans, which had been very actively in
14 field monitoring studies with first DDT and then
15 fenitrothion, came to the conclusion that unless the
16 use pattern of fenitrothion changed significantly there
17 was really very little justification for further
18 research on it, and that partly reflected the fact that
19 if one listed 20 factors that might be affecting
20 Atlantic salmon populations, forest spraying might make
21 the list or might, you know, might not. It was really
22 prioritizing research needs.

23 For some materials, the fact that a lot
24 of research isn't currently ongoing reflects the fact
25 that it's simply not a priority compared to other

1 things happening that may be more appropriate to study
2 in terms of the hazard they present.

3 Q. All right. Would you agree with me
4 then that if these chemicals, fenitrothion and carbaryl
5 and aminocarb, were being used over a wider range or a
6 wider geographic area and more intensely, that it would
7 make good sense to devote a fair amount of resources to
8 studying their environmental effects?

9 A. I think there are still areas, some
10 of which you've pointed out, things like studies of
11 impacts on snakes or frogs or raptors where one could
12 say there is an area that, for a decision-making
13 purpose, we in Ontario might want to do some studies.

14 I would suggest you would require some
15 fairly large use patterns and, because these are more
16 difficult organisms to study, you're getting into some
17 very expensive and perhaps iffy studies in terms of the
18 ability to draw hard conclusions from them.

19 Q. All right. I would like to go
20 through some conclusions. In your concluding remarks
21 at the end of your direct examination I believe it
22 was -- I believe you stated that the pesticides
23 registered for use in forest management have negligible
24 or limited impacts on sensitive non-target organism
25 communities.

1 Is that your recollection of your--

2 A. Yes.

3 Q. --conclusion? You agreed with me,
4 however, that there have been several animal groups,
5 such as amphibians and reptiles and raptors where there
6 has been little and, in the case of raptors, almost no
7 study on the impacts of pesticides.

8 A. There is certainly limited knowledge,
9 but then again I'm not sure they would fall within my
10 conclusion when I said sensitive, and did I use the
11 word indicator in there, or did I not?

12 Q. No, you said sensitive non-target
13 organisms.

14 A. Non-target, yes. I guess I would
15 say that I would have some suggestions that perhaps
16 they are not sensitive non-target organisms within the
17 context I drew that conclusion, that there are good
18 reasons for feeling that they are not at high risk
19 compared to some of the organisms studied more
20 intensely.

21 Q. But you agreed with me that they're
22 ecologically important groups?

23 A. Certainly ecological importance is
24 something that can be attributed to all kinds of
25 organisms, yes.

1 Q. And you would agree with me, given
2 that these aren't presently being used, that in fact at
3 present there's very little in the way of time and
4 money being spent on monitoring the effects of
5 carbaryl, fenitrothion and aminocarb?

6 A. In Ontario, yes, in this case.

7 MS. CRONK: Mr. Chairman - I'm sorry, Ms.
8 Kleer, to interrupt -- I just note for the record, and
9 I didn't rise during the question, I waited until the
10 end of it. When Ms. Kleer put the question to the
11 witness it was based on pesticides.

12 I think in light of the chemicals that's
13 she has just named the question was directed to
14 insecticides and insecticides only, and that those
15 offend the portions of the ESSA Document that she is
16 using, so lest they affect the hearing several months
17 from now, I would like to try to clear up the record.

18 THE CHAIRMAN: Would you agree with that,
19 Ms. Kleer?

20 MS. KLEER: I agree with that, that's
21 fine.

22 THE CHAIRMAN: Thank you, Ms. Cronk.

23 MS. KLEER: Q. Now, you would also agree
24 with me that there are some negative effects of
25 insecticides on some animal groupings that we discussed

1 earlier today?

2 MR. KINGSBURY: A. Yes.

3 Q. And just to take you through them
4 again for summary purposes, carbaryl has no negative
5 impacts on aquatic invertebrates?

6 A. Particularly on some groups of pond
7 dwelling invertebrates that reside in the types of
8 situations where carbaryl is inclined to persist.

9 Q. Maybe I'm confused, but I thought
10 that we had also discussed the study dealing with
11 impacts on aquatic invertebrates in streams in addition
12 to ponds; is that correct?

13 A. That's correct. Okay. To spell it
14 out clearly, I would agree that direct oversprays of
15 stream situations can impact particularly on aquatic
16 insect larvae and that direct oversprays of acidic
17 coloured ponds can impact on some pond invertebrate
18 species, particularly amphipods.

19 Q. And do you also agree with me that
20 carbaryl's effect on the growth rate of ducklings in at
21 least one study have been shown to cause a decrease in
22 the growth rate of those ducklings?

23 A. That they have -- that one study,
24 yes. The one study suggested a change in the rate of
25 growth of ducklings that the authors attributed to

1 changes in the foraging for invertebrates reflecting
2 changes in the invertebrate community.

3 Q. But you agreed that in that study
4 that was a reasonable conclusion for them to draw?

5 A. Yes.

6 Q. And you also agreed that there is
7 evidence of destruction of some honey bee colonies by
8 carbaryl spraying, direct spraying?

9 A. From agricultural studies primarily,
10 yes, using older formulations of carbaryl.

11 Q. Okay. Now, you stated in your
12 conclusion that these were negligible or limited
13 impacts. Do you still agree with that characterization
14 of those impacts?

15 A. Certainly I would tend to agree with
16 it very much. One, I think, as you will find pointed
17 out in my direct evidence, I feel that current
18 practices, as have been proposed to this Board, go a
19 long way in allowing mitigation of these kind of
20 effects, perhaps even elimination of some of them.

21 Q. But you've also stated several times
22 that at present, given the fact that these insecticides
23 are not being used, there is not a great deal of study
24 that's being done on them. So what I'm getting at is:
25 Is your conclusion not based on a fairly limited amount

1 of scientific evidence?

2 A. No, it's not, because specifically
3 for the insecticides we're talking about there has been
4 data generated on all of them since the 1960s and, in
5 fact, as I indicated in my direct evidence,
6 particularly during the years -- the 70s when they were
7 in very extensive use in a number of places, there was
8 a lot of literature generated on them.

9 THE CHAIRMAN: Mr. Kingsbury, in your
10 sort of review or knowledge of the various studies
11 around in other jurisdictions concerning the chemicals
12 that Ontario was using, are the use patterns in general
13 any more advantageous to a more limited impact or less
14 advantageous?

15 I guess what I am getting at: Does
16 Ontario use patterns -- or do Ontario use patterns
17 generally put Ontario on the conservative side,
18 vis-a-vis any environmental impacts, than many of the
19 jurisdictions where these studies have in fact taken
20 place?

21 MR. KINGSBURY: I think that would tend
22 to be true partly because in other jurisdictions at
23 times the scale of their protection programs has been
24 so big that they have gotten into things like the use
25 of four-engine aircraft, you know, right up to the size

1 of the old Super Constellation that Air Canada used to
2 fly which, of course; the bigger your program is, the
3 less sensitivity to local concerns and that in fact
4 many of these -- the largest programs were carried out
5 prior to the rather extensive level of provincial
6 regulation that's now in place, particularly expressed
7 in buffer zone restrictions, but also in just the level
8 of review such as the requirement for a site-specific
9 provincial permit.

10 THE CHAIRMAN: And just to follow that
11 through: In the jurisdictions that you've looked at
12 where there have been a lot of studies, do the results
13 from those studies give you any concern particularly
14 with respect to any of these chemicals should those
15 same use patterns take place in Ontario?

16 MR. KINGSBURY: No.

17 THE CHAIRMAN: So given our more
18 conservative use patterns you would have then logically
19 even less concern; is that the case?

20 MR. KINGSBURY: That's correct.

21 MS. KLEER: Q. I would just like to make
22 a qualifying statement. You stated in answer to his
23 question that you didn't have concern with respect to
24 the studies on other jurisdictions. That doesn't
25 apply, I take it, to carbaryl's effects on aquatic

1 invertebrates?

2 I mean, there was pretty clear evidence
3 in Maine that that's a problem. Is that a fair
4 assessment?

5 MR. KINGSBURY: A. I think that one
6 needs to put the data on the carbaryl impacts in
7 perspective.

8 One, I would not foresee any kind of a
9 use pattern approaching that to be something that is
10 likely to occur in Ontario, and I base that --
11 certainly in the area of the undertaking, one of the
12 main considerations is the fact that they were using
13 carbaryl in Maine at applications of three-quarters up
14 to a pound for spruce budworm control, and I've been
15 involved with the Ministry in Ontario and I don't
16 believe that the Ministry in Ontario would ever
17 envisage large scale use of carbaryl for budworm, for
18 that insect.

19 I think that Ontario's looked at all the
20 other options for that insect that they see as being
21 appropriate, and that is borne out historically by the
22 use pattern for carbaryl. There are still other insect
23 problems for which carbaryl may be the most appropriate
24 material to use.

25 They are, however, historically rather

1 limited. There is little reason to think they are
2 going to become massive problems and the small size of
3 the area that we are talking about makes it more
4 reasonable to think you can avoid things like the
5 direct overspraying of stream and pond situations.

6 Q. Just for the record - and you may not
7 be able to answer this and just tell me if you can't -
8 but does the MNR have any stated policy that: We are
9 going to limit the use or maintain the use of carbaryl
10 at the levels -- carbaryl, aminocarb and fenitrothion
11 at the levels at which they are currently maintained.
12 Can you answer that question?

13 A. I am not going to touch MNR's policy
14 regarding spraying chemical insecticides. I think that
15 has already been brought before the Board in some
16 detail.

17 Q. Okay. One final comment on this.
18 Now, you have called them negligible or limited
19 impacts.

20 A. One of the reasons I would go on to
21 say those are negligible or limited is because, in my
22 definition of negligible or limited, I would not
23 consider the temporary reduction or even elimination of
24 a given species of stone fly from an environment with
25 no further consequences down the food chain as making

1 that an impact that isn't limited or negligible.

2 Q. Would you agree with me that those
3 words, negligible or limited, are to some extent an
4 individual assessment of risk and particularly your own
5 individual assessment of risk; is that fair to say?

6 A. Absolutely. To the individual stone
7 fly that's killed it's not a negligible impact, in fact
8 it's --

9 Q. Well, I would agree.

10 A. And this is a concern, but I would
11 also point out that we are dealing with organisms, you
12 know, where mortality of individuals is part of the
13 biological system and I am not saying that makes it
14 okay or good, I am simply saying that ecological
15 function and long-term survival of populations is a
16 more appropriate thing to make your assessments on.

17 And in looking at those things, as I have
18 tried to point out repeatedly, looking at that level I
19 think we can say: Yes, they are negligible or limited.
20 It still comes down to the fact some people may say the
21 death of an individual of this species in this place,
22 you know, is an unacceptable impact. That kind of
23 judgment goes beyond me, obviously.

24 Q. All right. I would like to turn to a
25 few questions for Mr. Ritter. In the ESSA Document it

1 indicated that 2,4-D can be used with a water carrier
2 or with Diluent 585. Is Diluent 558 a fossil fuel
3 based carrier?

4 DR. RITTER: A. We have a minor
5 technical problem.

6 I am not sure, I believe it is. But I
7 would really like to verify that before giving you a
8 proper answer.

9 Q. Well, that makes it a little
10 difficult because I wasn't able to determine that
11 myself. Does anyone -- do you know, Mr. Kingsbury?

12 MR. KINGSBURY: A. I think I can verify
13 that it's basically a light stove oil.

14 Q. It's, pardon me, a...?

15 A. A light stove oil.

16 Q. All right. So it's a fossil fuel
17 based derivative.

18 A. Yes..

19 Q. Mr. Ritter, in New Brunswick, are you
20 aware as to whether or not New Brunswick makes use of
21 any fossil fuel based derivatives in their spraying?

22 DR. RITTER: A. They have over the
23 years. I certainly can't comment on as to what the
24 practice is in New Brunswick at this time, I have no
25 idea.

1 Q. All right. I will be introducing
2 some evidence later on this. Do you agree with me that
3 there are studies that indicate that fossil fuel based
4 carriers may contribute to the increased toxicity of a
5 pesticide to organisms, animals?

6 A. If you are asking the question in an
7 abstract sense, yes.

8 Q. Are you aware of any specific studies
9 yourself?

10 A. I'm not sure I am answering the
11 question you are asking.

12 Q. My question is: Has there been any
13 evidence on fossil fuel based carriers that are used in
14 conjunction with the active ingredient that indicate
15 that the toxicity of the formulation, not just the
16 active ingredient, could be increased because of the
17 usage of the fossil fuel based derivative or carrier
18 which has a toxicity all of its own?

19 A. There have been isolated reports in
20 literature. Dr. Ecobichon has published a number of
21 reports over the years alluding to the kind of thing
22 you are referring to.

23 Q. Would it not, in your opinion then,
24 given that such literature exists, be a less risky
25 position to take; i.e., that you would say: We will

1 use water based carriers and have less toxic effects
2 than if we were to use a fossil fuel based derivative
3 such as Diluent 585 along with the pesticide?

4 A. Not entirely. This is why I remarked
5 as to whether or not you were asking the question in
6 the abstract sense or in a practical sense.

7 There are two components really to your
8 question, or two answers to your question, if you like.
9 The first is a water based formulation. As I am sure
10 you are aware, water insoluble pesticides require the
11 addition of an emulsifier.

12 Now, we could spend some time debating as
13 to which is the lesser of two evils; substituting a
14 fossil fuel or any other organic carrier for that
15 matter, if you like. In some areas, for example,
16 canola oil has been used as a carrier.

17 With an organic soluble pesticide, to
18 replace that with water as a carrier and instead add an
19 emulsifier, as I say, one could spend some time arguing
20 as to which is the lesser of the two evils, but it will
21 be one or the other, it can't be both.

22 The second point is that it's a question,
23 as we have discussed at some length during the course
24 at least of my testimony, it's a question of exposure.
25 We can talk about, in the abstract sense, the intrinsic

1 properties of Diluent 585 or any other carrier for that
2 matter, but what we should really be concerned about is
3 the dose to which you and I might be exposed because,
4 to our view, the abstract sense as to the intrinsic
5 properties of the chemical really provides this Board
6 with very little useful information.

7 Q. Well, I would suggest that
8 accidental exposures can occur and if an accidental
9 exposure does occur - even though we don't want it to
10 occur - it would be better if it occurred without the
11 fossil fuel based derivative than a water carrier; is
12 that --

13 A. I'm sorry. I would be more inclined
14 to put the emphasis on trying to reduce the number of
15 accidents rather than in trying to make the accident
16 more acceptable.

17 Q. Well, I agree, but accidents do
18 happen; don't you agree?

19 A. There is no question that they
20 happen, but I think in any program, in any regulatory
21 program the impetus is to provide the maximum benefit
22 in the largest number of possible cases in
23 consideration of what I have just told you.

24 That is, if you were to substitute the
25 use of an oil for the use of an emulsifier, which

1 biologically might be unattractive so that these few
2 isolated accidents to which you refer benefit at the
3 expense of the vast overwhelming majority of cases to
4 which you have now exposed an unacceptable agent, I am
5 not sure that you have achieved anything in a public
6 health context.

7 Q. All right. We don't know what the
8 emulsifiers are that are used in a formulation; is that
9 correct?

10 A. That's correct.

11 Q. All right. I am not going to pursue
12 this any further.

13 MS. KLEER: My next topic has to deal
14 with buffer zones and it's my final topic, although
15 it's a long one. The Board will recall that in Panel
16 13 there is a reference to a page that sets out MNR's
17 policy on buffer zones for the aerial application of
18 pesticides and that is at page 116 of Volume 13. It's
19 actually going to be reproduced in another exhibit that
20 I will be putting before the Board.

21 MS. MURPHY: I think, just to clarify, if
22 we are thinking about the same document, I don't think
23 it's entirely accurate to refer to it as MNR's policy.
24 Those are the MOE guidelines for buffers if we are
25 talking about the same piece of paper.

1 MS. KLEER: Well, we are, but I think
2 that it will be borne out in Mr. Kingsbury's cross that
3 those were developed together with the MOE and the MNR,
4 even though they --

5 MS. MURPHY: And that was indeed Mr.
6 Nicholson's evidence on this very topic.

7 MS. KLEER: Q. All right. Mr.
8 Kingsbury, what is your present role, if any, in the
9 Eastern Spruce Budworm Council?

10 MR. KINGSBURY: A. Retired.

11 Q. But at one time you were with the
12 Eastern Spruce Budworm Council?

13 A. I acted as the chairperson for the
14 environmental committee of that Council, yes.

15 Q. And in 1986 were you also the program
16 organizer for a conference on the establishment of
17 buffer zones in the jurisdictions covered by the
18 Eastern Spruce Budworm Council?

19 A. Yes.

20 Q. And, just for the sake of the Board,
21 which provinces and states are represented on that
22 Council?

23 A. The Council is a Deputy Minister
24 level council that, as full members at the time I was
25 involved in it, included the State of Maine and the

1 Provinces of Newfoundland, New Brunswick and Quebec.
2 It also had as, not members but sort of as active
3 participants in it, the Province of Ontario, the
4 Province of Nova Scotia and the Canadian Forestry
5 Service and the U.S. Forest Service.

6 They were not contributing members, they
7 didn't contribute to the -- or they weren't sort of
8 voting members of the Council. That may have changed
9 since, I am not sure.

10 Q. All right. Just when we start out I
11 would like to read you a definition of buffer zone and
12 see if you agree with that definition, and when we
13 refer to buffer zone we will be talking about it in
14 these terms. The definition is:

15 "An area where there is no direct
16 discharge of pesticide but where some
17 pesticide may be deposited."

18 Is that your understanding of what buffer
19 zone means?

20 A. Yes, for a given purpose of limiting
21 the entry of pesticide into an area beyond the buffer.

22 Q. Okay. I would first like to look at
23 a few studies dealing with the phenomenon of pesticide
24 drift. The first is a study by Wood and Stewart and it
25 was done in 1976 and I will be distributing copies.

1 Stewart, for the record, is
2 S-t-e-w-a-r-t. (handled)

3 THE CHAIRMAN: That will be Exhibit 796.
4 ---EXHIBIT NO. 796: Study by Wood and Stewart, 1976.

5 MS. KLEER: Q. Now, this study looked at
6 measurements or took measurements of fenitrothion
7 residues in blueberry fields following operational
8 sprays; is that correct?

9 MR. KINGSBURY: A. Yes.

10 Q. Now, in 1973 did one field which was
11 three kilometres distant from the spray area show
12 residues of, I believe it was 28 grams per hectare,
13 that is on page 627 Table 2 -- sorry, not 28, if I said
14 28, I meant up to 18 for one particular field.

15 A. That's correct.

16 Q. All right. Then in 1974, there is a
17 table on page 628, Table 3, and did one field that was
18 examined have a residue of approximately 77 grams per
19 hectare and that is Area 2, Field 1?

20 A. That's correct.

21 Q. And there were other levels or other
22 fields that showed varying amounts of residue, some of
23 them nil, but ranging between nil and approximately 77;
24 is that correct?

25 A. That's right. There's a wide range

1 of residues measured not only between fields but also
2 within fields. For instance, we see that the field in
3 the one you referred to where it was 77, three
4 different -- I believe they are different samplers show
5 a range from 77, 74 to 39.

6 Q. Now, at the bottom of page 626, it's
7 indicated that samples collected at three locations
8 within an area directly below an operational spray
9 showed deposits of 36 -- or approximately 36, 61 and
10 133 grams per hectare. Are you with me at that point?

11 A. Yes.

12 Q. And you have no problems with those
13 figures, I take it?

14 A. No. My only concern is the nature of
15 the site, whether this was in fact an open field or
16 under a forest canopy.

17 Q. But you would agree with me that
18 in -- well, at least with respect to the 36 and 61
19 figures of grams per hectare, that those are comparable
20 to some of the residues that showed up in blueberry
21 fields up to three kilometres away from the site of
22 spraying?

23 A. They are comparable to the deposits
24 measured on these samples, yes.

25 Q. Yes. So does this indicate to you

1 that fenitrothion at any rate can travel quite a
2 distance, at least three kilometres and in fair
3 quantities?

4 A. That certainly is the suggestion from
5 this data. One of the problems with this kind of a
6 study, of course, is that where one is going to a large
7 number of fields and putting out samples, it is often
8 next to impossible to actually trace aircraft -- spray
9 aircraft movements, so one has to make some assumptions
10 that spraying took place where it was supposed to have
11 taken place.

12 Q. Well, we are always dealing with that
13 problem though in dealing with buffer zones; is that
14 correct?

15 A. That's correct, in dealing with
16 buffers, but in dealing with questions of movement of
17 fenitrothion off target, I would just suggest that
18 there is a very extensive body of knowledge, which I
19 wouldn't pretend in any way to be an expert on, where
20 more scientific studies have been done.

21 I think this is an excellent type of
22 study to do in that it's a monitoring study which
23 captures both ability to move and also compliance with
24 things like a buffer zone restriction, but I would just
25 caution about this being used as sort of primary

1 evidence suggesting that fenitrothion moves three
2 kilometres away from the spray block in an undiluted
3 concentration.

4 I think there is a lot better studies to
5 discuss -- to base discussion of movement -- off spray
6 movement of material on that have more known
7 quantities.

8 Q. All right. But at least these were
9 operational sprays that were being done; I mean, it
10 wasn't like they were using enormous amounts of active
11 ingredient?

12 A. No, I agree. It's also a very
13 complex spray operation where, again, the ability to
14 verify that each and every aircraft, that in fact some
15 of the fields weren't sprayed closer to the three
16 kilometres, et cetera, is difficult to substantiate.
17 It's not substantiated.

18 Q. That is fair to say. But one has to
19 deal with that in operational sprays all the time?

20 A. Yes.

21 Q. Right. I would like to turn now to
22 another exhibit which is excerpts from a study by
23 Crabbe, et al done for the National Research Council of
24 Canada, National Aeronautical Establishment. (handed)

25 THE CHAIRMAN: Thank you. Exhibit 797.

1 ---EXHIBIT NO. 797: Abstract of study entitled: New
2 Brunswick Forest Spray Operations,
3 Field Study of the Effects of
4 Atmospheric Stability on
5 Long-Range Pesticide Drift by
6 Crabbe, et al, National
7 Research Council of Canada,
8 National Aeronautical
9 Establishment.

10 MR. KINGSBURY: Ms. Kleer, could you
11 please just refer which -- you have provided me with
12 two studies; which one?

13 MS. KLEER: Q. Oh, sorry. This is New
14 Brunswick Forest Spray Operations, Field Study of the
15 Effects of Atmospheric Stability on Long-Range
16 Pesticide Drift?

17 A. Thank you. And the number for this
18 is...?

19 Q. 797.

20 A. Thank you.

21 Q. Now, I have only included the
22 abstract. I have the full report if anybody wishes to
23 see it, and I could file it for the Board if they are
24 so desirous.

25 I would like to turn to page 28, dealing
26 with concluding remarks. Now, did they in their study
27 find that in neutral flow or stable -- sorry, in
28 neutral atmospheric conditions that at 7.5 kilometres
29 from the site of application they found 16 per cent of

1 the amount that had been applied on the spray block?

2 If I may help. That is at the top of
3 page 28.

4 A. Okay. It says:

5 "On a relative basis field measurements
6 placed the final airborne concentration
7 at approximately 16 per cent in stable
8 flow and approximately 6 per cent in
9 neutral flow."

10 Q. Right.

11 A. I am not sure, without going further
12 what -- when they say, on a relative basis, I guess
13 they are -- I would take it there they are referring to
14 the fact that under those two conditions they were at a
15 different starting point in terms of concentration in
16 air.

17 Q. Well, I guess I understood that to
18 mean that we are just comparing neutral flow and stable
19 flow, and that they're relative, 16 per cent on the one
20 hand and 6 per cent on the other.

21 A. Okay.

22 Q. That was my understanding. Would you
23 accept that or --

24 A. I will accept that.

25 Q. All right. And 16 per cent at 7.5

1 kilometres that is - just on a layman's basis - that's
2 a fair amount to have travelled 7.5 kilometres; would
3 you agree?

4 A. Certainly it's -- to conceptually
5 think of movement of the material that far, yes, it
6 could be considered a fair amount. Again, what's a
7 fair amount?

8 Q. Well, 16 per cent is a figure.

9 A. Yes.

10 Q. I mean, that is all we have to deal
11 with. Sorry?

12 A. I guess one of my -- in saying 16 per
13 cent, however - and I guess this is when we are going
14 back to relative - if it's 16 per cent of what is left
15 floating around in the air within the target zone, that
16 is very different than 16 per cent of the total of
17 material, including all of it that has already impacted
18 on the forest in the target zone.

19 I am not sure whether we can clarify what
20 that reference is to with the portions of the document
21 we have here.

22 Q. Well, I guess it says:

23 "Final airborne concentrations at 6 per
24 cent of the initial mass of active
25 ingredient."

1 And, again, it's just my reading of that,
2 that initial mass means the whole amount that was
3 applied, the whole amount of active ingredient that was
4 applied.

5 You know, I understand your problem with
6 this, and perhaps I could get an undertaking if I gave
7 you -- do you have the whole study? Did I provide you
8 with the whole study?

9 A. No.

10 Q. At some point perhaps you could
11 provide me with an answer to the undertaking as to
12 whether or not that 6 per cent and 16 per cent refer to
13 6 per cent of the initial amount of the active
14 ingredient applied.

15 Perhaps you can clarify for me what your
16 confusion is?

17 MS. MURPHY: Well, just let's take this
18 one step at a time. I think it's difficult for the
19 witness to give counsel an undertaking to look at a
20 document that counsel has.

21 MS. KLEER: I am going to give him the
22 document.

23 THE CHAIRMAN: No, I think she's going to
24 give it to him and, if it's possible from the document
25 for you to give an answer to this question, to clarify

1 to what the 16 per cent is referring, then I think
2 counsel is asking you to give that undertaking.

3 MR. KINGSBURY: Okay. Mr. Chairman, I
4 guess I would advise the Board that I do not pretend to
5 be an expert in spray physics. Certainly that
6 expertise is available and I guess I would just
7 question to what extent would it be appropriate to go
8 beyond myself to answer the question that is being put
9 forward here.

10 MS. MURPHY: My difficulty, Mr. Chairman,
11 is that we have already called Mr. Nicholson who gave
12 evidence about these matters and generally discussed
13 some of these matters, and that is why I am
14 particularly concerned.

15 This witness is quite fairly advising
16 that he isn't the expert that could deal with that. My
17 concern is that Mr. Nicholson was already called.

18 THE CHAIRMAN: Well, Ms. Kleer, is there
19 something you want to hang on this difference?

20 MR. KLEER: Well, no. I mean, what I am
21 trying to get across to the Board is, there is evidence
22 of long-range pesticide drift and that --

23 THE CHAIRMAN: I think this witness has
24 admitted to that.

25 MR. KINGSBURY: Yes, I would agree to

1 that.

2 MS. KLEER: All right. I guess I'm
3 satisfised to leave it at that then.

4 MR. KINGSBURY: Okay.

5 MS. KLEER: Q. Okay. I would like to
6 turn now to a piece that was written by Dr. Ecobichon
7 and Walters which was presented at the '86 Buffer Zone
8 Conference at which you were -- I take it you were in
9 attendance at this conference?

10 MR. KINGSBURY: A. Yes.

11 MS. KLEER: (handed)

12 THE CHAIRMAN: Thank you. Exhibit 798.

13 ---EXHIBIT NO. 798: Article written by Ecobichon and
14 Walters, presented at the 1986
 Buffer Zone Conference.

15 MS. KLEER: Q. Now, the focus of this
16 article was the rationale for the establishment of
17 buffer zones near human habitation; is that correct?

18 MR. KINGSBURY: A. Yes.

19 Q. Now, do the authors of this report
20 suggest that part of the rationale for the
21 establishment of buffer zones near human habitation is
22 that levels of exposure acceptable in bystander
23 populations should take into account the range of ages
24 and health status of the population in contrast to the
25 age and health status of the "healthy worker"?

1 A. Can you tell me where you are
2 referring to there, please?

3 Q. Unfortunately, I -- let me just get
4 my marked up copy.

5 It's in the first paragraph that deals
6 with the difference between worker exposure and health
7 status of the bystander population, and I apologize to
8 the Board, I thought I had it marked.

9 A. I see what you are making reference
10 to now, I believe. On page 73 in the last two
11 sentences of the first paragraph.

12 Q. That is what I was referring to, but
13 I believe that my quote was taken from another -- if I
14 could have just a moment, I will find it.

15 THE CHAIRMAN: Would this be an
16 appropriate time to take a short break?

17 MR. KLEER: I'd be glad to.

18 THE CHAIRMAN: Okay. We will break for
19 15 minutes. Thank you.

20 ---Recess taken at 3:07 p.m.

21 ---On resuming at 3:35 p.m.

22 THE CHAIRMAN: Thank you. Be seated,
23 please.

24 MS. KLEER: Okay.

25 Q. I have had a chance to review this

1 now and in fact what I was referring to was at the --

2 MR. KINGSBURY: A. First paragraph.

3 Q. First paragraph, the last two
4 sentences. Okay. Do the authors of this report
5 suggest that levels of exposure that are acceptable in
6 the workplace are higher than those acceptable in
7 bystander populations, in fact far higher?

8 A. That's what they say, yes, on page 1.

9 Q. And do you agree with that, or are
10 you qualified to disagree or agree with that?

11 A. I'd defer to Dr. Ritter, I think...

12 Q. Dr. Ritter?

13 DR. RITTER: A. What's tolerable as a
14 matter of discretion, generally speaking, workplace
15 levels for anything are higher than they are for
16 general population.

17 Q. All right. And is that because what
18 you are looking at in the general population are ages
19 and health status that differ from the "healthy
20 worker"?

21 A. No. Generally speaking, the reason
22 for higher level of tolerance in the workplace is
23 because there are many, many, many levels of control
24 that can be instituted in the workplace which are not
25 possible in the general population.

1 Q. Sorry. But I guess what this is
2 suggesting is that the higher levels of exposure are
3 acceptable or tolerated in the workplace environment as
4 compared to the bystander population environment; is
5 that...

6 A. That's what this implies, yes.

7 Q. But I thought your comment was
8 directed towards controls on those exposures?

9 A. That's correct.

10 Q. So would you agree with me then that
11 levels of exposures, per se, that are tolerated in the
12 workplace environment are higher than those levels that
13 are tolerated in the general population, the bystander
14 population if you want to call it that?

15 A. Well, as I said, it's really a
16 question of who is doing the interpretation on
17 tolerance. They can be higher and they may be
18 tolerated at higher levels and they invariably are
19 higher because they're occupational; that is, it would
20 be a very peculiar situation where you would expect
21 someone who is not occupationally involved with the
22 function to be exposed to levels which are less than
23 someone who is not involved with the function. It's
24 just -- it's a statement in logic not in science.

25 Q. All right. But on a regulatory level

1 is this what this comment is directed towards in your
2 opinion, that on a regulatory level regulators will
3 tolerate a higher level of exposure in the workplace
4 than in the bystander population?

5 A. No. The level that one tolerates
6 from a public health point of view is a level which
7 will not produce an adverse effect. An adverse effect
8 is no more or less noteworthy in an occupationally
9 exposed individual than it is in an individual who is
10 not occupationally exposed.

11 The level of risk that one's prepared to
12 accept in an occupational setting - I'm referring now
13 not only to pesticides, but in the general sense - the
14 level of risk that one's prepared to accept in an
15 occupational setting may be higher because it's an
16 informed risk and because there are a variety of
17 procedures which one can implement.

18 I suppose by way of analogy what I'm
19 trying to say is that a pilot accepts that his risk of
20 dying in an airline crash is greater than mine. He is
21 simply in an airplane much more often, and if we accept
22 that the likelihood of that risk being realized is a
23 function of the frequency with which the risk is taken,
24 he is at a higher risk. It doesn't mean the higher
25 risk is tolerated, it means that it's a function of the

1 job.

2 Q. All right. We're not talking about
3 risk here, we're talking about exposure; all right?

4 A. They're synonyms for one -- I mean,
5 exposure is what produces the risk.

6 Q. All right. So then would you agree
7 with the statement that's made here, that levels of
8 exposure tolerated in the workplace environment are far
9 higher than those acceptable in the environment of the
10 bystander population?

11 A. No. The level of risk that's
12 tolerated is the level of risk or the level of exposure
13 which will not produce an adverse effect. That's the
14 level which is tolerated.

15 MR. MARTEL: Why wouldn't you reduce the
16 work level exposure then -- to the people who are
17 exposed to it more frequently in the workplace, why
18 wouldn't you reduce to eliminate or reduce the risk as
19 much as possible? Why wouldn't you reduce the exposure
20 level?

21 DR. RITTER: Why would you?

22 MR. MARTEL: Why wouldn't you.

23 DR. RITTER: You do. That's what I'm
24 saying. The objective is to reduce the level of
25 exposure to the point where it no longer produces an

1 unacceptable risk. That's exactly the point, and it
2 will invariably be lower in non-occupationally exposed
3 populations.

4 THE CHAIRMAN: Aren't they in fact using
5 the word tolerate not in the sense that many people
6 would think of that word, but using it in the sense
7 that that is what occurs?

8 DR. RITTER: That's correct.

9 THE CHAIRMAN: Period.

10 DR. RITTER: That's really the point I
11 was trying to make. I don't think the word is being
12 used in the context in which most people would use it
13 in this particular report.

14 MR. MARTEL: But in lead, for example, if
15 one compares the United States to Canada, Ontario at
16 least, the level at which we send people back into the
17 workplace is the level in fact that they are taking
18 them out at in the United States.

19 DR. RITTER: Yes.

20 MR. MARTEL: And there is a considerable
21 body of opinion that the levels are too high that we
22 send them back into in Ontario.

23 DR. RITTER: Yes. Mr. Martel, if we can
24 just pursue that for a moment. In the case that you
25 are referring to, it's a question of interpretation of

1 scientific data as to whether or not that level of
2 exposure will produce adverse effects.

3 That's a little more difficult to argue
4 because it depends on where you fall as to the
5 biological significance of that level: Are the
6 Americans right or are we right.

7 But if we can go back to the example
8 which I used perhaps, one of the airline incident, a
9 pilot understands that his risk of dying in an airline
10 crash is greater than yours or mine and, in fact, his
11 life insurance policy will invariably reflect that
12 because the more often he flies the more likely he is
13 to die in an airline crash.

14 That's not a matter of interpretation of
15 data, it's just a matter of frequency. That's really
16 the point that I'm trying to -- that I think these
17 authors are endeavouring to make. I think it's
18 reasonable to presume that the level of exposure in
19 occupationally exposed individuals will be greater than
20 the level of exposure in bystanders. That's all this
21 says.

22 MS. KLEER: Q. Well, I guess I would
23 have to -- I would like to go on to the next sentence
24 that says:

25 "Given the range of ages and health

1 status of this population in contrast to
2 that of the healthy worker, the reasons
3 are obvious; i.e., the reasons for
4 greater levels being tolerated in the
5 workplace as opposed to the bystander."

6 DR. RITTER: A. Yes.

7 Q. My interpretation of that was that in
8 the healthy worker situation you don't have little
9 children, you don't have old people, you don't have
10 people who are sick, the assumption is that you have a
11 healthy worker who is of - I don't know - moderate age,
12 35, 40, you know, and that the reason that you would
13 want to have a lower level of exposure on a regulatory
14 basis in a population that includes other elements,
15 such as the very young and the very old.

16 That was my interpretation of what this
17 meant; i.e., that you do in fact tolerate higher levels
18 of exposure to a healthy worker because he's more -- he
19 or she is more able to tolerate it than is a person who
20 is very old or very young. That was my interpretation,
21 and would you share that interpretation?

22 A. I think we are having difficulty with
23 the word tolerance. I think your interpretation of the
24 use of the term here tolerance is that one is prepared
25 to accept a higher level. I read that word a little

1 differently.

2 This to me really talks about the level
3 which one could withstand biologically and that's
4 different. When we are looking at an acceptable level
5 of exposure for an occupational setting, for example,
6 the level of exposure which we will consider to be
7 acceptable is that level or below which will not
8 produce an adverse effect.

9 Having said that, and with the knowledge
10 that the occupationally exposed individual will be
11 exposed to levels at least as great as and, in all
12 likelihood, many times greater than the bystander, we
13 have - I could use a legal term - ipso facto built in a
14 safety factor for the bystander.

15 Because if we say exposure level "x" is
16 all right for the person occupationally exposed, then
17 it goes without saying that exposure level "x" divided
18 by "y" for the bystander is also okay, and that's the
19 basis for the determination.

20 We don't have one margin of safety which
21 is acceptable for a worker and another margin of safety
22 which is acceptable for a bystander which is, I think,
23 the interpretation you're putting on that phrase. I
24 mean, to us the bystander from a public health
25 perspective is as important as the occupationally

1 exposed individual and the converse.

2 THE CHAIRMAN: But how do you get to that
3 level to say what is acceptable to the worker where
4 there is no effect if what you are looking at does not
5 include those elements of society which would be more
6 susceptible?

7 DR. RITTER: That's perhaps the most
8 difficult question I've had in the three weeks I've
9 been here.

10 MS. KLEER: Congratulations.

11 THE CHAIRMAN: I win the prize.

12 DR. RITTER: There is no easy answer to
13 your question. There has been debates in the
14 literature and within the scientific community forever
15 as to the kinds of consideration one should give to the
16 outlayers of population and, generally speaking, what
17 one tends to do is to model for the 95th centile; that
18 is, it's impossible to model for the extremes in an
19 population for those that are highly resistant or
20 highly sensitive. What one tends to do is to model for
21 those that fall somewhere inbetween.

22 MS. KLEER: Q. All right. Can I just --
23 I will just leave it this way: Would you agree with me
24 that the levels of exposure that could be tolerated by
25 the most sensitive population are going to be lower

1 than they are for a "healthy worker"?

2 DR. RITTER: A. Yes, I will agree with
3 you but I will add just one caveat. The levels to
4 which an informed bystander is exposed will also be
5 much lower than the level to which the healthy worker
6 will be exposed. You can't say one without saying the
7 other; not only do I expect that they will be more
8 sensitive, but I also expect that they will be exposed
9 to much less.

10 Q. On average?

11 A. Well, no, not an average. It's very
12 difficult to envision a situation where a bystander is
13 going to be exposed to more than someone who handles
14 the material in the course of their work.

15 Q. Well, let me suggest this to you: If
16 you were standing under a spray zone and for some
17 reason you were in that spray zone and you don't have
18 any protective clothing on and you are comparing
19 yourself to a person who is spraying and he has got on
20 his gloves, he's got on his mask, he's in a plane,
21 would that person; i.e., the person in the plane, not
22 be less exposed than the bystander?

23 A. Well, that situation that you're
24 describing specifically actually has been modelled and
25 the assumption has been made that the individual would

1 be thoroughly exposed directly below the spray swath
2 and, in that case, having stated - this is in a report
3 actually which you made available which Dr. Ecobichon
4 published - even under those sets of circumstances
5 where Dr. Ecobichon points out that it's really
6 unlikely that those conditions could be met, it still
7 produces a level of exposure which, in his words, are
8 negligible biologically.

9 Q. All right. I'm going to leave this
10 here. I know what you're referring to and I will be
11 dealing with that at some point later.

12 Okay. At page 74 of this report at the
13 bottom, in the pros section, it's indicated that:

14 "There is anecdotal information that
15 individuals beneath a spray block sprayed
16 with fenitrothion or aminocarb or
17 slightly downwind from the spray block
18 have experienced characteristic symptoms
19 of organophosphorus or carbamate
20 poisoning."

21 Are you reading that with me, Mr.

22 Kingsbury? It's right -- the last sentence on page 74.

23 MR. KINGSBURY: A. I see it there.

24 Q. Okay.

25 A. Again, I would defer it to Dr. Ritter

1 if you want to pursue it.

2 Q. All right. Do you have any reasons
3 to doubt that this anecdotal information does exist?

4 DR. RITTER: A. Anecdotal information is
5 just that, it's anecdotal.

6 Q. Right.

7 A. It exists, there's no question it
8 exists.

9 Q. Okay. Just for the sake of the
10 Board, briefly run through what those effects are? I
11 think they are written there, but...

12 A. You're referring to the top paragraph
13 on page 74?

14 Q. No, bottom paragraph, last sentence.
15 It refers to --

16 A. Dermal rash, pinpoint pupil, tearing
17 of eyes, numbness, tingling of skin, and systemic
18 effects such as respiratory and gastrointestinal
19 problems.

20 Q. And are those typical effects of
21 carbamate poisoning?

22 A. No. Dermal rash is not an effect of
23 a carbamate poisoning, it is more characteristically a
24 reaction to a solvent.

25 Q. All right.

1 A. Of any kind, not necessarily a
2 pesticide spray.

3 Q. What about respiratory and
4 gastrointestinal problems?

5 A. Gastrointestinal problems more
6 remotely, respiratory certainly could be, pinpoint
7 pupil would be, and depression of cholinesterase
8 activity would be the best indicator of likely
9 exposure.

10 Now, because the evidence is anecdotal it
11 invariably is not measured. Cholinesterase activity,
12 as you know from your earlier cross-examination, tends
13 to recover fairly rapidly once exposure -- once the
14 individual has been removed from exposure. It's about
15 the only reliable way to determine if exposure has
16 taken place. It's a symptom of exposure, not a symptom
17 of disease as used in an industrial hygiene context in
18 that way.

19 Q. All right. But we do have at least
20 some indication that some of these effects,
21 gastrointestinal problems, pupil -- pinpoint pupil and
22 tearing of the eyes and some of the other effects you
23 mentioned could be due to spraying with -- or carbamate
24 poisoning more specifically?

25 A. They could be. I would only caution

1 you with the weight you would attach to anecdotal
2 evidence in which there is no clinical confirmation of
3 exposure or any causal relationship whatsoever. These
4 effects could easily be attributed to a garden
5 insecticide.

6 Q. All right. The authors suggest at
7 page 74 that a direct overspray would result in an
8 exposure level of - and they have done a calculation -
9 of 87.9 micrograms per kilogram body weight. Do you
10 accept this as a reasonable estimate of expected
11 exposure?

12 A. In consideration of the assumptions
13 that you have made, yes.

14 Q. All right. And would this level of
15 exposure be expected to elicit symptoms of carbamate
16 poisoning?

17 A. No.

18 Q. But it is true that you've got this
19 anecdotal information--

20 A. That's right.

21 Q. --that may indicate carbamate
22 poisoning?

23 A. Yes.

24 Q. All right. The study also reviews
25 Reilly's work, and I believe that begins at page 78.

1 Now, this work indicates - and I would like you to
2 confirm this conclusion - that between two and three
3 kilometres from the edge of the spray block 20.5 to 82
4 micrograms per kilogram body weight would be the
5 exposure level to an active ingredient during a
6 one-hour time interval. Is that your reading of the
7 conclusions of this report?

8 A. You said 20.5?

9 Q. To 82.

10 A. You're reading at page 78?

11 Q. No, it starts at page 78.

12 A. Mm-hmm.

13 Q. And the 20.5 to 82 micrograms per
14 kilogram body weight is referred to in the first
15 paragraph, page 79, three bottoms up -- or three lines
16 up from the bottom of the first paragraph.

17 My question is: Do you agree with the
18 statement that the authors have made that the exposure
19 level during a one-hour time interval would be
20 approximately 20.5 to 82 micrograms per kilogram body
21 weight of active ingredient?

22 A. Again, based on the assumptions
23 they've made, that calculation falls out, but I would
24 also agree with the conclusion to that sentence that
25 you read from.

1 Q. Mm-hmm.

2 A. And that is that they would not
3 expect that that level of exposure would produce any
4 biologically relevant concentration.

5 I don't know if everyone in the room
6 actually has a sense for what these numbers are. This
7 is between 1/50th and 1/15th of a milligram. A
8 milligram is a thousandth of a gram.

9 Q. I appreciate that.

10 A. Yes, but I'm not sure everybody else
11 does.

12 Q. Okay.

13 A. It's a very, very small amount of
14 material.

15 Q. Okay. But still, I mean small
16 amounts of materials can produce effects?

17 A. Not small amounts of this order of
18 this kind of material.

19 Q. All right. So then I take it it
20 would be your conclusion - and I will just put it in my
21 words and then you can agree with me or disagree - that
22 the fact that you have anecdotal information and the
23 fact that the level of exposure beneath a direct
24 overspray of approximately 88. micrograms per kilogram
25 body weight don't indicate that perhaps there is some

1 doubt that could be cast upon the conclusion that at
2 approximately 88 micrograms per kilogram body weight
3 you are not going to have any effects of carbamate
4 poisoning evident?

5 A. That's correct. You have to provide
6 one additional qualification on the question you are
7 asking and; that is, that the 88 micrograms that you're
8 referring to is based, to some measure, on dermal
9 exposure. Because, as Dr. Ecobichon and Mr. Walters
10 point out here and elsewhere, the principal root of
11 exposure, as I referred to during the course of my
12 presentation, is dermal.

13 That is the total delivered dose, it's
14 not the body burden of the chemical. The 88 micrograms
15 would actually be reduced significantly once one would
16 correct for absorption. So that the actual dose is
17 really somewhat smaller than the 88, and I suspect
18 substantially smaller than 88.

19 The kind of question though that you're
20 asking has been more directly addressed by Dr.
21 Ecobichon in the additional report which you have
22 provided where he has actually gone through a
23 calculation to determine what the actual dose might be,
24 and he provides some commentary on the biological
25 importance that he would attach to those anticipated

1 levels.

2 You asked about whether or not I would
3 therefore dismiss the anecdotal evidence. I wouldn't
4 dismiss it. It's because of that anecdotal evidence
5 that these very kinds of studies that you're referring
6 to have been undertaken because there was only
7 anecdotal evidence to justify them at all, there was
8 actually no solid evidence to speak of. They are
9 sufficient reason to merit investigation.

10 That investigation has been undertaken on
11 several occasions by Ecobichon and others in the
12 Province of New Brunswick and they have routinely
13 provided results and estimates which indicate that at
14 the operational levels it is unlikely to produce
15 exposure which would have any biological significance
16 and that is with the assumption that the chemicals are
17 fully absorbed, that there is somebody standing
18 directly underneath the spray swath and that
19 approximately 80 per cent of their body area is
20 exposed.

21 Now, if you think about those three
22 conditions it is self-evident that they will never be
23 met.

24 THE CHAIRMAN: Would you, therefore,
25 consider that this anecdotal evidence has been

1 adequately refuted by the studies that have been done
2 to date?

3 DR. RITTER: Yes.

4 THE CHAIRMAN: That would be your
5 position?

6 DR. RITTER: My position is that I don't
7 have a ready explanation for the anecdotal evidence,
8 but I think it's difficult to refer it to the spray
9 program.

10 MS. KLEER: Q. All right. This study
11 also distinguishes for the purpose of determining
12 hazard to human health between oil and aqueous
13 formulations of pesticides.

14 Is it true, Dr. Ritter, that there is
15 some inherent toxicity - and I think we dealt with this
16 before - to the oil formulation in addition to that of
17 the active ingredient?

18 DR. RITTER: A. Yes.

19 MS. CRONK: Sorry, what chemical are we
20 talking about?

21 DR. RITTER: 585. Let me help you. Are
22 you referring to the 585?

23 MS. KLEER: No, actually I wasn't, I
24 was...

25 MS. CRONK: I don't mean to impede my

1 friend, Mr. Chairman. The reason I ask that inquiry is
2 because when she put this series of questions to Dr.
3 Ritter earlier they were based on 2,4-D. That is not
4 how I read this paper, it's not my understanding from
5 the authors. I would like it clarified.

6 THE CHAIRMAN: I think we also referred
7 to this 585 before too; did we not?

8 DR. RITTER: Yes.

9 MS. CRONK: I would like to know before
10 the answer is given.

11 MS. KLEER: My concern is more -- again,
12 I apologize, I had a marked up copy and I seem to have
13 misplaced it.

14 Q. On page 77, in the first full
15 paragraph, in the middle, it says:

16 "Partly at my insistence, the efforts of
17 New Brunswick were directed toward the
18 development of efficacious, aqueous
19 formulations. To make a long story
20 short, we expended a lot of funds and
21 energy to obtain an adequate animal rat
22 toxicity database for these formulations.
23 The results were always clearcut. These
24 agents neither enhanced nor induced the
25 inherent toxicity of fenitrothion or

1 aminocarb in contrast to an identifiable
2 and fully explained enhancement by oils."

3 That's what I am referring to. And I
4 guess what I'm asking is whether or not you agree that
5 there is an identifiable and fully explained
6 enhancement of toxicity of fenitrothion and aminocarb
7 by oils?

8 DR. RITTER: A. No, I don't have any
9 argument with the conclusion here.

10 Q. Okay. You accept that conclusion
11 then?

12 A. Yes.

13 Q. All right.

14 THE CHAIRMAN: Ms. Kleer, just before you
15 move on, were you intending to file this subsequent
16 study by Ecobichon that indicated the results of a
17 direct exposure to an aerial spray?

18 MS. KLEER: I'd be happy to file it. I
19 wasn't going to refer to it. I had originally referred
20 to it when I put it together, but I would be happy to
21 file it with the Board.

22 THE CHAIRMAN: All right. I think it
23 will complete the evidence on that area since we have
24 the one study that talks about the anecdotal evidence
25 and Dr. Ritter has alluded to this further study that

1 seems to refute it.

2 MS. KLEER: Q. Is that report that
3 you're referring to the 1981 study, Aerial Spraying of
4 Fenitrothion in Forest Programs: Some Problems and
5 Some Solutions.

6 DR. RITTER: A. Yes.

7 MS. KLEER: All right.

8 THE CHAIRMAN: I believe, Dr. Ritter,
9 just refer us to the area that you were alluding to?

10 DR. RITTER: Yes.

11 MS. KLEER: (handled)

12 THE CHAIRMAN: Thank you.

13 DR. RITTER: If it would facilitate, Mr.
14 Chairman, I can refer specifically, if you like, just
15 very quickly to the sections of that paper to which I
16 was referring during my comments.

17 They would begin on page 1049 of that
18 document, right-hand column at the top, starts with
19 the description of a model which is used subsequently
20 in the calculation. The sentence starts with:

21 "The peak aerosol concentrations at
22 chest height underneath the sprayed
23 swath of forest were approximately
24 15 ng per litre."

25 It then goes through a series of

1 calculations. Incidentally, it's interesting to note
2 that the numbers generated in here are entirely
3 consistent with the earlier worked published by Crabbe
4 which I think provides some measure of assurance that
5 it's probably correct.

6 I would then refer you to the right-hand
7 columns on page 1050 which then provides the reader
8 with a comparison of the levels tested experimentally
9 in animals and the levels to which humans would be
10 exposed under the conditions which this experiment
11 describes. Specifically in the latter part of that
12 column, and I'm taking it a little out of context:

13 "Crabbe...estimated that, under present
14 spraying conditions and with estimates of
15 subcanopy aerial fenitrothion
16 concentrations at ambient temperature
17 being of the order of 40 ng per
18 minute per litre, a human breathing at a
19 conservative level of 12 litres air
20 per minute would inhale 500 ng of
21 fenitrothion if standing at the spray
22 line, a dosage of 8.3 ng per
23 kg body weight for a 60-kg individual.
24 This dosage is 20..." to (sic)
25 "...500-fold lower than the inhaled

1 intermediate dose in the rat if we assume
2 that 25 % of the particles inhaled
3 are deposited..."

4 And goes on and on and on, and perhaps if
5 I can then refer you to page 1051 - and I won't
6 belabour this very much further - the left-hand column
7 this time, on the bottom of the page about halfway
8 through:

9 "If this amount was absorbed totally,
10 then the dosage for a 70-kg man would be
11 87.9 mcg. per kg body weight..."

12 Which is, I believe, Ms. Kleer, the
13 number to which you referred earlier. Dr. Ecobichon
14 then goes on to conclude:

15 "This quantity, taken with the amount
16 inhaled..."

17 That is, he is now totalling all possible
18 routes of exposure and assuming that they are all fully
19 absorbed:

20 "...would still be a minute dose and one
21 which would elicit no biological effects
22 whatever if administered by any route to
23 the most sensitive animal species."

24 And then he goes on to describe some of
25 the anecdotal evidence.

1 If you then were to follow the bottom of
2 the right-hand column on 1051, what this work actually
3 did was to result in a narrowing of buffers in use in
4 New Brunswick rather than the other way around.

5 MS. KLEER: Q. That's right. No, I was
6 going to refer to that later, so...

7 DR. RITTER: A. But I think it's
8 important to note that this work actually lead the
9 Province of New Brunswick to conclude that their
10 buffers were unnecessarily large.

11 Q. And is it also not true that buffer
12 zone that they ended up with was 300 metres as opposed
13 to 1.6 kilometers; is that correct?

14 A. That's correct. It was reduced very
15 substantially based--

16 Q. All right.

17 A. --on this kind of a reference.

18 THE CHAIRMAN: Okay. Could we admit this
19 then as Exhibit 799.

20 ---EXHIBIT NO. 799: Article entitled: Aerial spraying
21 of fenitrothion in forest
22 programs: some problems and
23 solutions, authored by D.J.
24 Ecobichon.

23 MS. CRONK: Could I also ask, Mr.
24 Chairman, just so that I understand it, if Dr. Ritter
25 can clarify the number that he read into the record

1 when he read that passage at the bottom of page 1050.
2 I think he said that the dosage was 20 to 500-fold
3 lower? Does he read it that way or 20,500?

4 DR. RITTER: Sorry, that's what I meant.

5 MS. CRONK: Thank you.

6 DR. RITTER: Approximately 20,000 times
7 less than the inhaled dose.

8 MS. KLEER: Q. A distinction is made I
9 believe in New Brunswick for the purposes of
10 establishing buffer zones between types of aircraft; is
11 that correct?

12 DR. RITTER: A. That's correct.

13 Q. Are you familiar with the reasons why
14 such a distinction would be made?

15 A. Because of drift. Mr. Kingsbury
16 referred a few moments ago to the use of four-engine
17 aircraft as opposed to single-engine, dual-engine, so
18 on and so forth, but these -- aircraft design can have
19 a significant effect on aerodynamics.

20 Q. I have attempted to obtain this
21 information myself, but are you aware of what types of
22 aircraft are used in Ontario?

23 MS. MURPHY: Well, my friend didn't ask
24 me and if she had we would have advised that Ontario
25 uses what generally is described in here as small

1 aircraft, not four-engine, large aircraft that they are
2 talking about here.

3 THE CHAIRMAN: But what is that;
4 one-engine, single-engine, twin engine?

5 MR. KINGSBURY: Ag-aircraft.

6 MS. MURPHY: Ag-aircraft.

7 MS. KLEER: All right. Thank you. I
8 called the Ministry of the Environment and I didn't get
9 that information:

10 Q. Okay. I would like to turn to a
11 paper by Mr. Sexsmith which deals with the
12 establishment of buffer zones in New Brunswick and this
13 was also given at the '86 Buffer Zone Conference.

14 (handed)

15 THE CHAIRMAN: Thank you. Exhibit 800.

16 ---EXHIBIT NO. 800: Article entitled: The Evolution
17 of Buffer Zones for Forest Insect
18 Spraying in New Brunswick by W.A.
Sexsmith.

19 MS. KLEER: Q. First, with respect to
20 blueberry picking areas, are you familiar with what
21 caused the establishment of a buffer zone for spraying
22 of fenitrothion and aminocarb around these areas, and
23 I'd refer to pages 6 and 7 of this article?

24 DR. RITTER: A. Not really. This was a
25 decision which was taken internally in the Province of

1 New Brunswick and I am only really peripherally
2 familiar with what drove that decision.

3 Q. Mr. Ritter, I would like to address
4 my questions to Mr. Kingsbury, since he has been
5 involved in this exercise.

6 MR. KINGSBURY: A. Placing a buffer zone
7 restriction around blueberry areas was in response to
8 concerns about impacts on wild pollinators pollinating
9 the blueberry crop.

10 Q. And what is the present buffer zone
11 used in New Brunswick for around blueberry picking
12 areas?

13 A. I guess present -- the most recent
14 information that I have would say it's 3.2 kilometres.
15 I am not sure whether that has been revised in the last
16 two years.

17 Q. I will deal with that later in
18 another exhibit. With respect to human habitation,
19 what two factors according to Sexsmith prompted the
20 establishment of what was originally a 1.6-kilometre
21 setback in the 1977 spray program?

22 MS. MURPHY: Could you just identify what
23 we should look at.

24 MS. KLEER: Yes, I will do that.

25 MR. KINGSBURY: I believe if you are

1 referring on page 7, they talk about:

2 "Combined public pressure against the
3 spray program and drift study information
4 resulted in a government decision to
5 institute a 1.6-kilometre setback."

6 MS. KLEER: Q. Yes.

7 MR. KINGSBURY: A. Is that to which you
8 make -- so it's probably pressure and reference to a
9 drift study. I am not sure which drift study, I guess
10 it's...

11 Q. Well, I guess we are going -- as
12 we've determined recently we now know that that buffer
13 zone has been reduced to 300 metres?

14 A. Yes.

15 Q. And that is based upon studies by Dr.
16 Ecobichon?

17 A. Yes, and others.

18 Q. Now, with respect to municipal water
19 supplies what is, to your knowledge, the present buffer
20 zone?

21 THE CHAIRMAN: Is that in Ontario or New
22 Brunswick?

23 MS. KLEER: Q. In New Brunswick. I am
24 just dealing with New Brunswick now and I would refer
25 you to -- this was in -- I refer you to Table 6 at page

1 10. '85 was the most recent time period that this
2 study was dealing with.

3 MR. KINGSBURY: A. I believe -- oh, I am
4 sorry, Table 6.

5 Q. Yes, Table 6, page 10.

6 A. Municipal water point of extraction.
7 The buffer for both chemical and biological
8 insecticides is 3.2 kilometres.

9 Q. All right. I am just going to be
10 dealing with the chemical insecticides in my evidence,
11 so we will just restrict it to that.

12 MS. MURPHY: Could I just -- I mean, I
13 don't know, but can we just ensure that what Mr.
14 Kingsbury is doing to respond to his questions is
15 relying upon what it says in this paper. We don't know
16 if this is current, it may well be, but I would just
17 like to ensure that we are all aware that he is just
18 relying on what it tells him in this paper.

19 THE CHAIRMAN: Is that correct, Mr.
20 Kingsbury?

21 MR. KINGSBURY: That's correct.

22 MS. KLEER: Just for the Board's
23 information, I will be producing a 1989 permit that
24 will indicate the present or the 1989 zones.

25 Q. And are you aware of what the

1 rationale was for establishing this 3.2 kilometre zone?

2 MR. KINGSBURY: A. Is it contained in
3 the paper?

4 Q. Yes. I would like to refer to page
5 7.

6 A. Yes.

7 Q. And in the second paragraph --

8 A. The theory being the extra
9 1.6-kilometre setback from human habitation would
10 provide additional protection to watersheds draining
11 into the drinking water supplies.

12 Q. Just to clarify, is that with respect
13 to human habitation or 1.6 extra kilometres with
14 respect to the municipal drinking water supply?

15 A. As I understand it, they added an
16 additional 1.6 kilometres, they doubled the buffer from
17 human habitation when they applied it to drinking water
18 supplies to make it 3.2 kilometres. And, again, I
19 would point out this is for both chemical and
20 biological insecticides.

21 Q. Now, at page 7 there is also
22 reference to the buffer zone established for lakes and
23 for major rivers and that is at the bottom paragraph
24 there. And in 1978, would you confirm that the size of
25 that buffer zone around lakes and major rivers was 400

1 metres?

2 A. Yes, that's correct.

3 Q. And then turning back to Table 6 in
4 1985, is that also the same buffer zone that remained
5 in New Brunswick?

6 A. That's correct.

7 MS. KLEER: Okay. At this point I would
8 like to introduce a copy of the spray permit, a 1989
9 spray permit where the names have been removed to
10 protect the innocent.

11 (handed)

12 THE CHAIRMAN: Thank you. Exhibit 801.

13 ---EXHIBIT NO. 801: Copy of 1989 Spray Permit issued
14 by Minister of Municipal Affairs
15 and Environment, Province of New
Brunswick, with names of parties
deleted.

16 MS. KLEER: Q. Just one question on --
17 just turning to the aircraft again. Do you know - and
18 you may not be able to answer this question - but is it
19 the case that only small aircraft are used in Ontario
20 for aerial application of spray?

21 MR. KINGSBURY: A. Yes, that's --

22 MS. MURPHY: I think -- I was assisting
23 earlier, but I think that was...

24 MS. KLEER: And that is in all cases.
25 That is all I wanted to confirm.

1 MS. MURPHY: And as well that was the
2 evidence earlier in the panel.

3 MS. KLEER: Q. All right. I would like
4 to look at the 1989 buffer zones that are indicated in
5 this permit that was issued to a particular sprayer.
6 At paragraph 4 -- and just to clarify, this permit is
7 with respect to sumithion, or however one would say
8 that, which is a formulation of...?

9 MR. KINGSBURY: A. Fenitrothion.

10 Q. Thank you. Paragraph 4, does it
11 indicate that around open bodies of water, using small
12 aircraft - sorry, not small aircraft - but paragraph 4
13 using TBM and DC-6 aircraft that the buffer zone is 400
14 metres around open bodies of water?

15 A. That's correct. I would point out
16 that DC-6 aircraft certainly fall in the category of
17 large aircraft.

18 Q. That's right. And then if we look at
19 paragraph 11, for small agricultural aircraft--

20 A. Yes.

21 Q. --it would be 65 metres; is that
22 correct?

23 A. "...spraying of chemical
24 formulations....be conducted within 65
25 metres of bodies of water."

1 That's correct.

2 Q. All right. And paragraph 6 that
3 deals with municipal surface drinking water supplies,
4 is the buffer zone still 3.2 kilometres?

5 A. That's correct.

6 Q. And with respect to large aircraft
7 for permanent residences, paragraph 7, is the buffer
8 zone 1.6 kilometres, and that is again just for large
9 aircraft?

10 A. That's correct, that is for chemical
11 formulations.

12 Q. All right.

13 A. Again, I believe that the restriction
14 for water municipal drinking supplies still applies to
15 both chemical and biological.

16 Q. Okay. And for completion, at
17 paragraph 10, for small agricultural type aircraft,
18 what is the buffer zone around human habitation?

19 A. It says 300 -- for chemicals 300
20 metres and for biological formulations 155 metres.

21 Q. All right.

22 THE CHAIRMAN: Why would there be a
23 difference between mobile homes and permanent
24 residences if they are both occupied by humans?

25 MR. KINGSBURY: I believe you are

1 misreading that, Mr. Chairman. I think the
2 reference -- the difference is with respect to
3 chemical-based formulations and biological
4 formulations, although it is subject to interpretation.

5 MS. KLEER: I agree.

6 THE CHAIRMAN: Yes. Okay.

7 MS. KLEER: Q. And finally, on paragraph
8 8, outside ecological reserves what is the size of the
9 buffer zone using large aircraft?

10 MR. KINGSBURY: A. 400 metres.

11 MS. KLEER: All right. I would like to
12 turn briefly now to a second set of buffer zones that
13 were established in Maine which -- this is also from a
14 paper that was given at the 1986 Buffer Zone
15 Conference.

16 (handed)

17 THE CHAIRMAN: Thank you. Exhibit 802.

18 ---EXHIBIT NO. 802: Article entitled: Buffer Zones for
19 Maine's Spruce Budworm Suppression
Operations, by Stephen Oliveri.

20 MS. MURPHY: Excuse me. Are you going to
21 be going back to this or not?

22 MS. KLEER: No, I am finished with this.

23 MS. MURPHY: Can we just note that I was
24 discussing with my friend earlier, after reviewing
25 this. It appears that there is a last page that -- we

1 were discussing -- my friend can't recall what was on
2 it, but we are sure it's probably nothing more than a
3 signature, but we did discuss it and suggest we add
4 that page once we get...

5 MS. KLEER: I will endeavor to provide
6 that to the Board.

7 THE CHAIRMAN: Very well.

8 MS. KLEER: Q. In 1985, with respect to
9 chemical insecticides used in Maine, and I refer you to
10 Table 2 at page 18, and dealing with the column that is
11 headed SA which, if you look at the little footnote
12 refers to small aircraft, what was the size of the
13 buffer zone outside of permanent human habitation?

14 MR. KINGSBURY: A. 800 metres for
15 chemical insecticides.

16 Q. And would you have any knowledge of
17 what that is at present or not?

18 A. In the absence of an active spray
19 program in Maine, I suggest that there probably hasn't
20 been a change in that -- I don't think there has been a
21 spray program to which these kind of buffers would be
22 applied.

23 Q. Now, at page 25 of this study it
24 indicates at the bottom paragraph, the last sentence
25 that:

1 "An even more intensive study by
2 (Shehata, 1984) demonstrated that the...
3 800-metre buffer zones for human
4 habitation effectively eliminated human
5 exposure to operationally sprayed
6 aminocarb."

7 Is that correct?

8 A. Yes.

9 Q. And are you familiar at all with that
10 study?

11 A. No, I am not familiar, having looked
12 at the reference. It relates to a human health
13 question and I am not sure whether Dr. Ritter would
14 care to comment.

15 Q. I would just ask, are you familiar
16 with that study?

17 DR. RITTER: A. Only very vaguely. I
18 haven't seen it in some years, but perhaps what's
19 noteworthy again is the last part of that sentence from
20 which you are reading and; that is:

21 "Even under worst cases conditions of
22 prolonged exposure, the risk to the
23 general public was negligible."

24 Q. And that was at an 800-metre buffer
25 zone?

1 A. Presumably it refers to the sentence
2 before it.

3 Q. And if we look at the sentence before
4 that that talks about 1982 and in 1982, if we refer to
5 the -- oh, I apologize, I thought there was a table for
6 1982 setting out what they actually had as buffer
7 zones. So we don't really know whether or not that
8 refers to an 800-metre zone or what zone that refers
9 to.

10 Would you agree with me then that Maine
11 in establishing its buffer zones for 1985 relied on
12 their own studies to conclude that an 800-metre zone
13 effectively eliminated human exposure to operationally
14 sprayed aminocarb?

15 A. Yes.

16 Q. Turning to page 20, did Maine
17 conclude that for areas oversprayed with carbaryl --
18 not oversprayed, just sprayed with carbaryl, that the
19 buffer zones that they had in place were inadequate to
20 protect stream invertebrates?

21 MR. KINGSBURY: A. That's correct. That
22 conclusion is in the first -- the third paragraph.

23 Q. And did they conclude this based both
24 on modeling results and field results?

25 A. Yes, they did.

1 Q. Now, Grant -- no, sorry, Grantham in
2 1982 and, Trial and Cree in 1981 experimented with
3 leaving unsprayed headwater refugia for repopulation of
4 aquatic invertebrates in downstream areas; is that
5 correct?

6 A. That's correct.

7 Q. And could you tell me what Maine
8 concluded from these experiments?

9 A. That basically it was not an
10 appropriate strategy, it was an ineffective strategy.

11 Q. All right. I would just like to
12 briefly refer to the ESSA Document again and I would
13 like to turn to page 86.

14 And I refer to the first full paragraph
15 the last sentence where its referring to the Grantham
16 study of 1982 and which I believe is the same one that
17 Maine was referring to, and it states there that:

18 "Grantham...provides evidence that both
19 headwater refugia and no-spray buffers
20 provide stream invertebrates with a
21 degree of protection from these effects."

22 A. That's the conclusion as it's stated
23 in the ESSA Document. I would suggest that we are
24 dealing with a difference of interpretation. The ESSA
25 Document included in its -- the group present at the

1 workshop are Joan Trial, who carried out some of these
2 studies, whereas the paper that we are discussing was
3 by Stephen Oliveri, who was an individual working with
4 the Maine Forest Service primarily in organizing and
5 contracting for monitoring studies.

6 So these two individuals appear to have
7 interpreted the study differently, although the ESSA
8 Document makes reference to a broader range of studies
9 than is referenced in Oliveri's paper. Whether that is
10 one of the reasons for the difference, I am not sure.
11 I would certainly suggest that Ms. Trial was intimately
12 acquainted with these studies because I know both her
13 personal and published record in terms of her
14 involvement with them.

15 Q. But would you agree with me that
16 Maine decided -- the State of Maine decided as a policy
17 matter that these attempts or using this method of
18 leaving unsprayed headwater refugia for repopulation in
19 downstream areas was not satisfactory and, therefore,
20 they made certain conclusions with respect to the use
21 of carbaryl?

22 A. That is what Mr. Oliveri indicates in
23 his paper, although --

24 Q. And he's acting as a representative
25 of the Maine Forest Service, Department of

1 Conservation; is that correct?

2 A. He's an employee of that agency. I
3 am not sure whether he, in this paper, is talking about
4 their policy. Certainly there were a number of factors
5 which led the State of Maine to make a choice for other
6 materials, specifically aminocarb.

7 I might just point out that in my
8 perception, Ontario made that choice long before this
9 point in time, that Ontario had chosen primarily to
10 choose as a chemical insecticide aminocarb for their
11 spruce budworm insecticide of choice.

12 Q. As compared to carbaryl?

13 A. Over carbaryl or fenitrothion or
14 other options.

15 THE CHAIRMAN: Mr. Kingsbury, in view of
16 the fact that I think the earlier evidence was that
17 Ontario does not use the carbamate --

18 MR. KINGSBURY: Carbaryl which is only
19 one of a number of carbamates.

20 THE CHAIRMAN: Sorry, carbaryl the way
21 Maine did or still does and hasn't used it for at least
22 four years, I think the evidence was?

23 MR. KINGSBURY: I believe it's
24 considerably more than four, certainly it's four. I
25 believe it's probably about six or eight, but that --

1 Ms. Murphy made reference to that data. It could be
2 different.

3 THE CHAIRMAN: Okay.

4 MS. MURPHY: As I recall, and I am going
5 to -- I will correct it if I am wrong, but my
6 understanding is that the evidence is that the last use
7 in Ontario was 1984.

8 THE CHAIRMAN: Okay. And they made that
9 decision not to use it and to use a substitute for
10 various reasons, that not every jurisdiction has of
11 course agreed with necessarily.

12 Notwithstanding that the Ministry wants
13 the flexibility to use any product that is currently
14 registered for use, does the Ministry take any position
15 with respect to any future use of this particular
16 insecticide?

17 MS. MURPHY: Well, I think the evidence
18 that has been put forward already, in particular by Mr.
19 Churcher, is that it's very difficult to know what
20 combination of circumstances one might face in the
21 future.

22 And I think the point he was attempting
23 to make in his evidence-in-chief is that without
24 knowing the specific set of circumstances and the
25 specific situation that might arise in the future, it's

1 difficult to make a generic statement for now and for
2 all time.

3 MS. KLEER: Q. Could you confirm what
4 Maine has done or has decided as a policy decision to
5 do with respect to using carbaryl?

6 MS. CRONK: Based on this paper?

7 MS. KLEER: Based on this paper.

8 MS. CRONK: Thank you.

9 MR. KINGSBURY: Maine, based on this
10 paper, made a choice I believe in 1983 when aminocarb
11 was registered in the United states, quoting "at
12 dosages effective against spruce budworm".

13 I might point out that it had been
14 registered in Canada at those dosages for over a
15 decade. They chose aminocarb as the product of choice
16 and subsequently when mexacarbate, another carbamate
17 material going by the commercial name of Zectran became
18 available, they again chose mexacarbate as their
19 material of choice. Part of the rationale behind these
20 changes was an increasing safety towards aquatic
21 organisms and other components in the environment.

22 I would point out that in Canada
23 aminocarb had been previously registered a long time
24 prior and mexacarbate was extensively studied and, in
25 fact, our institute put a lot of work into the

1 generation of preregistration data and certainly feel
2 it's an appropriate material for use.

3 The fact of the matter is that partly as
4 a result of changes in the ownership of this product,
5 it is not currently available for use in Canada even
6 though it has a rather excellent and up-to-date
7 registration petition available. But the ownership of
8 the product changed hands and they have not chosen to
9 pursue forestry registrations of it.

10 THE CHAIRMAN: Ms. Murphy, the Board is
11 having a little difficulty in this area, and I will
12 explain what it is and you can perhaps take it under
13 advisement or consideration.

14 The policy appears to be at the present
15 time in Ontario that there is no chemical spraying at a
16 policy level at the present time in any event, there is
17 the use of BTs where this kind of spraying is allowed.

18 Now, that may well change at some point
19 the future and the Board can well understand why the
20 Ministry may want the flexibility and, in fact, some
21 members of the Ministry's technical staff have
22 advocated that chemicals be allowed to be used
23 notwithstanding that from a policy standpoint the
24 government has decided that there is a temporary at
25 least moratorium on its use.

1 So the Board can understand that the
2 Ministry may want a properly registered chemical
3 insecticide to be in its arsenal, so to speak, to use
4 in the future, if necessary.

5 MS. MURPHY: Which carbaryl is.

6 THE CHAIRMAN: Which carbaryl is. But by
7 the same token, the Ministry has chosen not to use
8 carbaryl, as I understand it, even when it could and
9 chose to go to something else, notwithstanding
10 jurisdictions like Maine continued its use.

11 MR. KINGSBURY: If I could just clarify
12 there.

13 THE CHAIRMAN: All right.

14 MR. KINGSBURY: That certainly given the
15 fact that they had at least three other options for
16 spruce budworm control; namely, BT, fenitrothion and
17 aminocarb they chose not to make carbaryl a product of
18 choice for spruce budworm control.

19 However, for other insect pests such as
20 gypsy moth the same options are not available because
21 fenitrothion and aminocarb have no registration or --
22 and probably have no potential use pattern against
23 gypsy moth, they are not effective against that pest.

24 MS. MURPHY: I think I would remind you,
25 if I could, I will take you back - I know it seems a

1 long time now - but Mr. Churcher did deal with a number
2 of these matters and he pointed out, as did in fact Mr.
3 Kingsbury earlier, that different products have effects
4 on different target organisms obviously and, in
5 addition, that one cannot at this point in time know
6 what the full range of products that might be available
7 to you as a practical matter might be in the future.

8 It was explained to you earlier for
9 example - I think Mr. Kingsbury made reference to it
10 but also in the earlier evidence of the panel - that
11 there are products currently registered that are not
12 actually available because they are not made any more,
13 for example.

14 So given all of those circumstances, that
15 is the situation and I am advised, for example, that
16 this particular product is one of the few that could be
17 used in the situation where one has had to deal with
18 oak leaf shredder, for example. So that being the
19 case, what we're advising is that we are discussing the
20 products that are registered.

21 THE CHAIRMAN: No, I understand that. I
22 guess what the Board was concerned about, that if
23 because of what you say there is the real possibility
24 that carbaryl may be used in the future, and given the
25 fact that as a result of this cross-examination and

1 perhaps evidence to be adduced by other parties in
2 their side of the case, the effects of using this have
3 to be looked at in some detail.

4 If we are going to go that route, then we
5 will have to hear all the evidence because it may be
6 open to the Board at a future date, in terms of a
7 decision after considering all the evidence that the
8 Board may well place restrictions on the use of
9 carbaryl, if it so determines from the evidence that
10 that's appropriate.

11 And I guess what I am canvassing at this
12 point, if the Ministry still wants to retain the option
13 of using this particular chemical in the future for
14 whatever it may be used for for which there isn't a
15 good substitute, then I think we are going to have to,
16 you know, pursue this course of your examination, Ms.
17 Kleer, and any others who want to go into the effects
18 of this into some detail where there appears to be some
19 evidence that, at least in some jurisdictions, there is
20 some concern with this particular chemical to a larger
21 degree than a concern for some of the other options
22 that are being considered in terms of chemical
23 insecticides.

24 MS. MURPHY: And again if I might, Mr.
25 Chairman, I have no argument with you on that. This

1 information and the panel that did the ESSA Report
2 looked at and has provided information of this very
3 nature and it is in that report.

4 THE CHAIRMAN: Yes.

5 MS. MURPHY: And I have certainly not sat
6 up and said that what my friend is asking is
7 irrelevant. I haven't done that.

8 THE CHAIRMAN: No, the Board was just
9 inquiring what the real intention of the Ministry was
10 with respect to this chemical because, if it in fact is
11 we are not going to use it, and if you are prepared to
12 say we are not going to necessarily apply for approval
13 of its use from this Board as part of the application,
14 we could perhaps short circuit this area of the
15 evidence based on the current usage pattern.

16 But if that is not the case, then we will
17 just proceed as we are.

18 MS. CRONK: If I can add to that, Mr.
19 Chairman, as I have done on one occasion in the past,
20 that the position of the OFIA and the OLMA is not
21 unlike that that Ms. Murphy has described on this
22 particular issue, and whether that was the position of
23 the Ministry or not, it would be the position of our
24 clients before this Board that the continued and
25 possible use of all the chemical insecticides currently

1 registered, when appropriate, depending on pest type,
2 should be subject and approved by this Board at the end
3 of the day.

4 THE CHAIRMAN: Okay.

5 MS. CRONK: So it is an issue from this
6 quarter, if no other.

7 THE CHAIRMAN: All right. Well, that
8 settles it for sure in that sense. Proceed.

9 MS. KLEER: All right. Thank you.

10 Q. I would like to just -- one more
11 question on Maine.

12 MS. MURPHY: If it's a new area, I would
13 like to ask my friend, since she's been asking about
14 various policies of Maine, and she did ask the
15 witnesses to look at a paragraph which is the second
16 full paragraph on page 20 and, as I understand it, the
17 witnesses were asked to comment on sentence one and
18 sentence two of that paragraph.

19 I would appreciate it if we could read
20 into the record the final sentence in that paragraph.

21 MS. KLEER: Sorry, which paragraph --
22 sorry, which page?

23 MS. MURPHY: Page 20.

24 THE CHAIRMAN: It is Exhibit 802?

25 MS. MURPHY: Yes, I think that's the

1 exhibit we are still looking at. Yes, that's the one.

2 Page 20, the first full paragraph which begins:

3 "The model indicated..."

4 Do you see it? And the first two
5 sentences, counsel asked the witnesses to comment on
6 those. I would appreciate to have read into the record
7 the final sentence of that paragraph.

8 MS. KLEER: I have no problems with that.
9 I will read it in:

10 "As a result of these studies; i.e.,
11 the model results and air sample result
12 studies and the successful performance
13 of smaller aircraft, Maine resolved to
14 use large aircraft only in the more
15 remote regions of the state."

16 MS. MURPHY: Thank you.

17 MR. KINGSBURY: Could I just expand for a
18 second on that. I think that Ms. Murphy has pointed
19 out something that needs to be kept in perspective when
20 you read -- take into consideration and give weight to
21 the evidence that's come out here, that in this
22 author's opinion it hasn't been possible to provide
23 buffer zones adequate to protect aquatic invertebrate
24 populations.

25 One must remember; one, that the model on

1 which that's based, and I believe you will find the
2 field studies were based on large aircraft spraying
3 with buffer zones attached to them, which may not be
4 totally applicable to total practices in Ontario.

5 And I would also say that the data that
6 the author has said here which says those buffer zones
7 do not afford protection to aquatic invertebrate
8 populations are interpreted differently, for example,
9 as done in the ESSA Document where that and other
10 studies lead to the conclusion that headwater refugia
11 and no sprayed buffers provide stream invertebrates
12 with a degree of protection.

13 And I would make the final point that,
14 once again, both of these authors can probably be
15 totally justified in making their conclusions depending
16 on how they define impact, whether they're talking
17 about reduction of a species of stone fly or whether
18 they're talking about a significant impact on aquatic
19 invertebrates in terms of reduction of fish food
20 available.

21 So it's an area that I would advise,
22 caution in looking behind conclusions is appropriate.

23 MS. KLEER: Q. I would agree. I would
24 only state and ask your opinion on this, Maine as a
25 state, not just the author of this report, concluded or

1 decided at any rate, based upon perhaps just this
2 factor, perhaps another series of factors, to have --
3 to switch from carbaryl to aminocarb.

4 MS. CRONK: Again, based on this paper?

5 MS. KLEER: Q. Based on this paper?

6 MR. KINGSBURY: A. That's correct.

7 Q. And this paper is a presentation
8 given at a buffer zone--

9 A. Yes.

10 Q. --conference by an employee of the
11 Maine Forest Service--

12 A. Maine Forest Service.

13 Q. --Department of Conservation?

14 A. Yes.

15 Q. Okay. Just one final point then on
16 Maine's buffer zones. Just for the record, in 1985
17 what buffer zones did Maine use around municipal water
18 supplies and, again, I would refer --

19 A. Page 6?

20 Q. Well, I don't think there are any '86
21 figures, just '85, and I'm referring to page 18, Table
22 2, the bottom line.

23 A. 1.6 kilometres.

24 Q. All right. And on page 24, paragraph
25 3, it states:

1 "To minimize risk from direct
2 consumption, animal intakes are protected
3 from chemical insecticides by buffer
4 zones 1 mile..." which is 1.6
5 kilometres.

6 Would you agree with me that that is an
7 indication of why Maine chose to have 1.6-kilometre
8 municipal water supply intake buffer zones to minimize
9 risk to humans from direct consumption?

10 A. Yes, that's what they state.

11 MS. CRONK: Sir, I don't -- I am sorry.

12 THE CHAIRMAN: It may not be the position
13 of Maine, it is the position of this organization,
14 or --

15 MS. CRONK: Relies -- that's point No. 1,
16 sir. I say that because I anticipate that it's fairly
17 safe to say that you will be receiving other evidence
18 on this issue in due course.

19 The second point is, really the evidence
20 is going on in the sense that the author of this paper
21 refers to guidelines for buffer zones recommended and
22 put forward by two different authorities in the nature
23 of Maine, one of which is the Pesticide Control Board,
24 and one of which is the Maine Forestry Service.

25 Those guidelines are different depending

1 upon the service and depending upon the agency and
2 depending upon the nature of the resource at issue.
3 That's the first point. That's not been throughout --
4 the numbers put forward through the blanket approach
5 with respect to buffer zones. In my respectful
6 submission, without criticism, it is important that
7 this be understood, that there is a difference as you
8 analyse the issue. That's the second thing.

9 Thirdly, we are receiving evidence that
10 some of the information on those buffer zones is to the
11 current as reflected in this paper. Would that be the
12 case, I would like the statement apparent now.

13 MS. KLEER: I have no problem with that.
14 It is based on those 1985 figures.

15 MS. CRONK: Sorry, 1985 figures. And all
16 I am saying is, I would like it clear on the record
17 that if one talks about a buffer zone of before, as my
18 friend just did, a mile, one has to know whether that's
19 the Pesticide Control Directorate, the Forestry
20 Service, what their authority is, whether it applies
21 today because the numbers are different in that paper.

22 MS. KLEER: Just to clarify then, the
23 figures that I have been referring to; i.e., the 1.6
24 kilometre figures are for the Forestry Service and not
25 the Board of Pesticide Control.

1 THE CHAIRMAN: They may not necessarily
2 represent the State of Maine's position?

3 MS. KLEER: Notwithstanding it's given by
4 an employee of the Forest Service. I am not certain of
5 the position of these people commenting and whether
6 they speak on behalf of their forest department or
7 forestry department or what.

8 Q. And perhaps you can help us with
9 that, Dr. Kingsbury? You were the workshop organizer
10 for this. Are these individual opinions or are they
11 the opinions written on behalf of the Ministry or
12 department that these people are representing?

13 MS. CRONK: I am sorry, sir, I object to
14 that question. I don't think this witness is in the
15 position to answer that, save to elicit what his
16 understanding was.

17 It is quite clear - I don't want to be -
18 my history about this information is contrary to the
19 impression that's being left here. You will be
20 receiving evidence about this in the future and rather
21 than deal with it six months from now I might as well
22 raise the difficulty now. But on this question, I
23 object to this question based on this witness'
24 inability to answer it.

25 MS. KLEER: Let me ask him whether or not

1 he can answer that question.

2 THE CHAIRMAN: He may have an
3 understanding. It may not be factually correct, but
4 let's hear what your understanding is of the authority
5 from which the figures in this paper were given.

6 MR. KINGSBURY: For the purposes of this
7 workshop we invite from each jurisdiction
8 representation from both environmental and forestry
9 agencies. In some jurisdictions they basically put
10 together a combined presentation; in other areas that
11 came strictly from the environmental organization.

12 My understanding of the presentation from
13 the State of Maine is that it came from the Maine
14 Forest Service per se. There was no attendance, as I
15 can recall, and I think that if I make reference to the
16 buffer zone workshop itself, which is somewhere here, I
17 am not sure that there was any participation in this
18 workshop by the agency that reference has been made to
19 by Ms. Cronk.

20 I'm sorry, I don't have that. I'm not
21 sure I can find it, or if even it is in the workshop
22 proceedings. I don't see a list of attendees, but I
23 think that my impression is that this came pretty much
24 from the Forestry Service in Maine.

25 THE CHAIRMAN: Okay. I don't think we

1 can go any further than that.

2 MS. KLEER: Okay. I would like to turn
3 to the history of the paper that was presented at the
4 buffer zone conference by Ms. Michalowicz. Is that how
5 one pronounces that? At any rate, I will now introduce
6 it.

7 MR. KINGSBURY: Michalowicz.

8 MS. KLEER: Thank you.

9 THE CHAIRMAN: Exhibit 806.

10 ---EXHIBIT NO. 803: Document entitled: Buffer Zones:
11 Their application to forest insect
12 control operations, Proceedings of
13 the Buffer Zone Workshop, Eastern
Spruce Budworm Council's
Environmental Committee, Quebec
City, April, 1986.

14 MR. KINGSBURY: For the reporter's
15 purposes I can spell that name. M-i -- I'm sorry.

16 MS. KLEER: I think it is Michalowic. It
17 is M-i-c-h-a-l-o-w-i-c.

18 MR. KINGSBURY: Wanda told me
19 Michalowicz.

20 MS. KLEER: All right. I stand
21 corrected.

22 THE CHAIRMAN: The man knows Wanda
23 personally so he probably has better information than
24 you do.

25 MS. KLEER: Q. All right. In Ontario in

1 establishing those buffer zone guidelines - and that
2 may have been introduced into evidence already, and
3 perhaps I am treading on soft ground - but was it the
4 case that a committee of the Ministry of the
5 Environment and Ministry of Natural Resources Pesticide
6 Control officers together with the MOE head office
7 staff established these buffer zone guidelines in
8 Ontario?

9 MS. MURPHY: Yes, it was. We will remind
10 you -- direct you to the evidence of Mr. Nicolson. He
11 advised that he was one of the people involved in that.

12 MR. KINGSBURY: Yes, and I agree.

13 MS. KLEER: Q. At page 36, Wanda
14 Michalowic - I may have that wrong - indicates a number
15 of factors that should be considered in establishing
16 buffer zones, and I would like to refer to the third
17 paragraph on page 36.

18 And could you indicate to me what are
19 those factors that are considered in establishing
20 buffer zones?

21 MR. KINGSBURY: A. Type of pesticide,
22 its hazards and effects on the environment, nature and
23 sensitivity of the areas to be protected, the types of
24 spray equipment used and the database available to make
25 decisions -- scientific database.

1 Q. And in the next paragraph does she
2 also indicate that there may be other factors that are
3 considered in establishing buffer zones?

4 A. That is correct.

5 Q. And what are those factors?

6 A. Public opinion and political
7 pressures.

8 Q. When she talks about political
9 pressures - and you may not know this - but do you have
10 any idea what she was referring to? Was this at all
11 discussed?

12 THE CHAIRMAN: Well, at best it would be
13 hearsay, but...

14 MR. KINGSBURY: Political pressures have
15 historically been a big part of decisions regarding
16 forest spraying. So I am not totally unfamiliar with
17 them, certainly, and it reflects the sensitivity in
18 some areas in some years of this issue and the fact
19 that public perceptions of things like hazard and
20 benefits of spray programs may not coincide with those
21 of statistical experts or government employees,
22 whatever.

23 That tends to create conflict in the
24 politician who is being advised by a technical expert
25 but is also aware of perceptions of the public.

1 MS. KLEER: Q. All right. According to
2 Wanda, what were the basis upon which the '84 and '85
3 buffer zones were established?

4 MS. MURPHY: What are you referring to?

5 MS. KLEER: I am referring to that.

6 MR. KINGSBURY: Just refer me, please.
7 Is this in the fifth paragraph there?

8 MS. KLEER: Q. Yes. And I am referring
9 now to the '84 and '85 one which I believe dealt with
10 only northern Ontario, and I am referring specifically
11 to the last sentence in that paragraph.

12 MR. KINGSBURY: A. Okay. After
13 considerable discussion with MNR - Wanda is of course
14 with MOE - a review of monitoring data from MOE and MNR
15 and the scientific literature and MNR's current forest
16 management policies, on the basis of those things, the
17 committee formulated in 1984 guidelines for northern
18 Ontario and they were taking into consideration the
19 fact there -- the fact that, generally speaking, forest
20 spraying in northern Ontario occurs in remote areas and
21 isn't hindered to any great extent by human habitation.

22 Q. You may not be aware of this, but I
23 will ask it: Are you aware what specific studies were
24 used to arrive at the zones established around human
25 habitation? Were you involved in that exercise at all?

1 A. I provided advice but I wasn't
2 involved in the establishment process.

3 Q. This may be not something that the
4 Ministry of Natural Resources is willing to do, but I
5 was wondering, for the sake of integrity of this
6 hearing, would it be possible for us to obtain a list
7 of the studies that were used?

8 MS. MURPHY: Well, in fairness, Mr.
9 Chairman, we brought forward the best evidence who was
10 the person who advised you in his evidence he was
11 involved.

12 I have no idea now whether there is any
13 such list, but we brought forward for my friend - and
14 my friend did cross-examine - and for anyone else, the
15 best evidence there was on this matter and it's unfair
16 to ask this witness to respond, but it's certainly
17 difficult to ask us now to respond on paper given the
18 fact that she had the opportunity to ask the very
19 person -- bearing in mind, shall I say, that she had
20 the opportunity to ask the very person.

21 MS. KLEER: Well, I recognize that,
22 however, it was only apparent -- it only became
23 apparent to us what relevance this had once we started
24 looking at the pesticides issue - which I apologize, but
25 we didn't do it until now - and I think it's important

1 evidence for the sake of the Board's conclusions with
2 respect to the whole pesticide spraying process, given
3 that buffer zones are an important part of the whole
4 management exercise.

5 MS. MURPHY: Can we do this, just to
6 expedite. My friend advised what she would like. Can
7 I take that under advisement --

8 THE CHAIRMAN: Let's go one step further.
9 If the Board were to request the Ministry to prepare
10 such a list, if such a list exists, Ms. Kleer, that
11 would not entail recalling anybody to answer questions
12 on those studies.

13 MS. KLEER: I agree with that. I
14 guess --

15 THE CHAIRMAN: You would be provided with
16 the information in those documents, if they in fact
17 exist, and a list of the studies and you would develop
18 any points you wish to develop from that information
19 through your own witnesses.

20 MS. KLEER: That is acceptable. So do I
21 take that to mean that you --

22 THE CHAIRMAN: Well, I mean, I want to
23 know if that is agreeable to you?

24 MS. KLEER: That's acceptable to me.

25 MS. MURPHY: May I just know for certain

1 what it is we are being asked to provide?

2 MS. KLEER: All right.

3 MS. MURPHY: A list of the studies; was
4 that it?

5 THE CHAIRMAN: List of the studies upon
6 which the 1984 guidelines were predicated or based; is
7 that correct, Ms. Kleer?

8 MS. KLEER: Yes, that is what I am
9 looking for.

10 THE CHAIRMAN: If such--

11 MS. MURPHY: If such a list exists.

12 THE CHAIRMAN: --exists in the first
13 place.

14 MS. MURPHY: Fair enough. And I will
15 make inquiries and determine whether such a list
16 exists. I understand your comment to mean that that
17 would not require going back and recalling --

18 THE CHAIRMAN: Recalling any of the
19 witnesses who were part of the process of developing
20 those guidelines.

21 To that extent, Ms. Kleer had the
22 opportunity to explore the collateral issues at the
23 time that panel was called and those witnesses were
24 called and if she has the documents that she is seeking
25 she can develop whatever points she wishes to,

1 presumably through your own witnesses.

2 MS. MURPHY: Well, Mr. Chairman, there is
3 a wrinkle here. I am advised by my clients and people
4 who know about this, is that the literature review at
5 that point in time was undertaken by the Ministry of
6 the Environment.

7 MS. KLEER: Well, would it not be
8 possible to go to the Ministry of the Environment to
9 get this information?

10 MS. MURPHY: You mean, to go to the
11 Ministry of Environment and ask them? Perhaps we can
12 discuss this with --

13 THE CHAIRMAN: All right. Why don't you
14 do this, counsel: Why don't the three of you get
15 together, counsel for MNR, the Ministry of the
16 Environment and Ms. Kleer and see if you can sort this
17 out amongst yourselves.

18 MS. MURPHY: That is fine.

19 THE CHAIRMAN: Is that fair?

20 MS. KLEER: I'm sorry, I was...

21 THE CHAIRMAN: I am suggesting that you
22 get together with Ms. Seaborn and Ms. Murphy and see if
23 you can sort out whether or not: (a) such a list
24 exists and (b) whether there would be any problem in
25 producing such a list.

1 MS. KLEER: I am satisfied with that.

2 Thank you.

3 THE CHAIRMAN: Okay. But the Board would
4 be adverse to recalling any witnesses that have
5 previously testified to deal with that evidence for it
6 feels that you could probably develop whatever points
7 you wish to through your own evidence.

8 MS. KLEER: All right.

9 Q. Just to go through the '84 and '85
10 buffer zones, and looking specifically at human
11 habitation with respect to herbicides, was the buffer
12 zones in '84 and '85 a thousand metres?

13 MR. KINGSBURY: A. Yes, it was.

14 Q. And other than herbicides; i.e.,
15 aminocarb, fenitrothion and carbaryl, was at 1,500
16 metres?

17 A. That's correct.

18 MS. CRONK: Sorry, sir. That is what the
19 table says, that is not what the text says and perhaps
20 Ms. Kleer would like to look at the bottom paragraph.

21 THE CHAIRMAN: Minimal?

22 MS. KLEER: I am not dealing with BT at
23 all, which I believe the bottom paragraph deals with.
24 I am only looking at the first two columns; i.e.,
25 herbicides 2,4-D and glyphosate.

1 MS. CRONK: I beg your pardon then, I am
2 sorry. I beg your pardon.

3 MS. KLEER: Q. Now, on page 39 we see a
4 table that is reproduced in the -- in Panel 13 at page
5 116, I think. So I take it that this table, Table 2,
6 is the table of guidelines that are presently being
7 followed in Ontario; is that correct?

8 MS. MURPHY: I understand that that is at
9 page 166 of that document not at 116.

10 MS. KLEER: Sorry, pardon me.

11 MS. MURPHY: Is that the one?

12 MS. KLEER: My writing is illegible to me
13 too.

14 THE CHAIRMAN: Well, is the table exactly
15 the same?

16 MS. MURPHY: That's our reference.

17 MS. KLEER: It is at page 39 and it's the
18 same. I just wanted confirm that it was in fact the
19 same in '85 -- or sorry, in '86 as it is now.

20 THE CHAIRMAN: Very well.

21 MR. KINGSBURY: Having looked at those
22 two, yes, I believe that's correct, that they are
23 identical. The footnotes have changed.

24 MS. KLEER: Q. For the areas of human
25 habitation then, in Table 2, and at present, what is

1 the buffer zone for herbicides 2,4-D and glyphosate?

2 A. 120 metres.

3 Q. And in '85 what was it, going back to
4 the --

5 A. One thousand metres.

6 Q. All right. And for chemical
7 insecticides aminocarb, fenitrothion and carbaryl, it
8 is presently 240; is that correct?

9 A. 240.

10 Q. And it was in '85 1,500 metres?

11 A. 1,500.

12 Q. And you would agree with me that
13 these are fairly substantial reductions?

14 A. Yes.

15 Q. Okay. I would like to examine the
16 rationale behind these changes. According to your
17 reading of the fifth and sixth paragraphs on 38 -- on
18 page 38, and according to whatever knowledge you have
19 of the situation, would you agree with me that the
20 change was made because the northern Ontario standards
21 wouldn't work in southern Ontario from an operational
22 point of view?

23 A. That is one interpretation of it.
24 Another interpretation of it would be that when -- as
25 we discussed, political pressure as being a factor that

1 is considered when one takes into account establishment
2 of buffer zones, one of the things that came to play
3 was in southern Ontario there was political pressure
4 that was looking for spraying of gypsy moth close to
5 human habitation being brought to bear, which was
6 different than the political pressures which perhaps
7 were being brought to bear at the time that the
8 regional buffer zones were established that were saying
9 we don't want pesticides sprayed close to human
10 habitation.

11 Q. All right. Looking at the sixth
12 paragraph, the second sentence, it says:

13 "These discussions indicated that
14 they..." i.e., the guidelines for
15 northern Ontario:

16 "...were not appropriate from an
17 operational point of view."

18 Now, would you agree, or is it your
19 knowledge that in addition to the factor that you've
20 raised; i.e., political pressures, part of the reason
21 was that it was not workable from an operational point
22 of view in southern Ontario?

23 A. My understanding of it is that to
24 spray, certainly for gypsy moth, the application of the
25 buffer zone restrictions that were then in place would

1 basically make it impossible to carry out any kind of a
2 control program in southern Ontario because it was an
3 area with a lot of population.

4 The other operational constraint of
5 course is that the values to be protected were, in many
6 cases, closely associated both with human habitation
7 and human use. They were -- in fact much of the gypsy
8 moth spraying was done in places like provincial
9 campgrounds, et cetera, where the very intent was to
10 preserve the area for human use.

11 Q. Would you agree with me that in
12 establishing the earlier buffer zones for northern
13 Ontario that the MOE and the MNR had decided that the
14 larger buffer zones; i.e., 1,000 metres and 1,500
15 metres could be tolerated operationally in northern
16 Ontario. And I am referring to paragraph 4 at page 38
17 where it states in the fourth sentence:

18 "Wide buffer zones can be tolerated
19 operationally in northern Ontario with
20 pesticide spraying being directed at high
21 value forests for timber production."

22 A. Okay. Oh, I see it.

23 Q. So what I'm asking is: Is it your
24 understanding when you read this that the Ministry of
25 the Environment and MNR in establishing those earlier

1 buffer zones had decided that they could be tolerated
2 operationally in northern Ontario?

3 A. Certainly in northern Ontario they
4 did not limit the operational -- they did not place
5 unreasonable operational constraints, that's correct;
6 i.e., you could still meet the purposes of the
7 protection program to a large extent within the
8 constraints of the buffer zone policy.

9 Q. So why was it then that the Ministry
10 of the Environment and the MNR decided to place
11 northern Ontario under the same buffer zone regime as
12 southern Ontario? Can you answer that question?

13 A. Part of that I believe -- certainly
14 my advice to them at that time was: You cannot justify
15 having a different buffer zone north and south on
16 scientific basis, certainly not in terms of hazard that
17 the material poses.

18 In my case I was certainly indicating
19 that with respect to the environment because it's not
20 different, and certainly at that time in discussion
21 with these individuals that would be a point that I
22 would make, is that you may feel it is very appropriate
23 to have a difference for some other reason, but you
24 can't pin it on the scientific database.

25 Q. But then I'm confused. What was

1 the -- what were the '84 and '85 ones based upon then
2 if -- they were based upon a review of the scientific
3 literature in part; were they not?

4 A. In part, but also the other factors
5 which you had me go through which included political
6 considerations. One of the things that I would point
7 out and one of the reasons that this workshop was held
8 was because, as you can imagine, each of these
9 jurisdictions went through an evolutionary process and
10 you will find that Ontario was not the only area where
11 there were rather large changes made in buffer zone
12 restrictions over years.

13 In fact the extreme is -- far more
14 extreme than this, that for one year in the Province of
15 Quebec buffer zone restriction for chemical spraying to
16 human habitation was made at 10 kilometres. That has
17 subsequently been reduced by at least -- by more than
18 10 and I believe 20- to 30-fold and that indicates the
19 kind of fluctuations that took place.

20 Part of this to me is simply the
21 environmental agencies getting their feet wet in an
22 area where suddenly they have jurisdiction and
23 responsibility and come in cold in terms of expertise
24 and experience, and that one of the reasons this
25 workshop was held was so that the different

1 jurisdictions could share these experiences and
2 hopefully increase the conformity not necessarily of
3 the policies they set - because, of course, that's
4 clearly each jurisdiction's own prerogative - but of
5 the way in which they go about the rationale by which
6 they establish buffer zones.

7 And I see this as an example of that
8 happening in this jurisdiction, and I would point out
9 that it happened in all of the jurisdictions that
10 reported at that workshop.

11 Q. In establishing these '86 buffer
12 zones of 120 and 240 metres, was any, to your
13 knowledge, specific consideration given to human health
14 concerns?

15 A. Absolutely.

16 Q. Then there obviously was some
17 difference between New Brunswick and Maine; i.e., New
18 Brunswick had a 300 -- established a 300-metre zone
19 based on Dr. Ecobichon's studies and that was with
20 small aircraft and Maine, on the basis of its own
21 considerations, established an 800-metre?

22 A. But I would point out that both those
23 jurisdictions said there is no that - and I believe the
24 wording is eliminated - effectively eliminated exposure
25 at 800 metres. I think something like that is the

1 wording in both those cases. It is contained in the
2 previous testimony.

3 That does not in any way say that that is
4 the minimum buffer zone needed to eliminate that
5 hazard; it's simply saying there was no hazard at 800
6 metres.

7 The fact that the same agencies - and I'm
8 getting into Dr. Ritter's area, I should probably let
9 him speak - but these same agencies basically are
10 evaluating the safety of this material for people
11 handling it and are under the plane, you know,
12 indicates that it's not a case of: 800 metre is a
13 required or 300 metres is a required buffer zone to
14 eliminate any substantial hazard to humans.

15 Q. Are you -- sorry.

16 THE CHAIRMAN: Mr. Kingsbury, what buffer
17 zone, in your opinion, would be required to make
18 spraying operationally possible in southern Ontario?

19 MR. KINGSBURY: It totally depends on the
20 objectives of the spray program. Certainly, when...

21 THE CHAIRMAN: I mean, obviously at 240
22 metres supposedly it's operationally possible to do
23 some spraying in southern Ontario, that is one of the
24 reasons they set it at lower than thousand or 1,500.

25 MR. KINGSBURY: Generally on Crown land

1 that is the case. When one gets to public lands, for
2 example a cottage owner trying to protect his cottage
3 property, even that restriction can be intolerable.

4 THE CHAIRMAN: But if you went to 800
5 metres, for instance, like it's indicated in some of
6 the other jurisdictions, would that in your opinion
7 operationally rule out spraying for the most part in
8 southern Ontario?

9 MR. KINGSBURY: Associated with the kind
10 of pest outbreaks we have had in the past. To a very
11 large extent it might still allow you to do some
12 spraying in large provincial parks, places like that.

13 MS. KLEER: Q. But you agreed with me
14 earlier that -- I believe you agreed with me earlier
15 that in northern Ontario a thousand metres and 1,500
16 metres worked from an operational point of view?

17 MR. KINGSBURY: A. With the nature of
18 the pest problems they were dealing with at those
19 times, they did not place critical operational
20 constraints; that is not to say that it didn't mean
21 that there might have been some situations, perhaps
22 some high value situations like seed orchards,
23 nurseries, plantations close to human habitation which
24 weren't removed from spray programs because of the
25 restrictions that might have, from a forestry

1 perspective, required the protection.

2 Q. And you would agree with me that the
3 thousand metre and 1,500-metre buffer zones would
4 create a greater margin of safety around areas of human
5 habitation than the lower 120 metre and 240-metre
6 buffer zones?

7 A. I guess rather than referring to Dr.
8 Ritter's evidence, I would defer the question to him.
9 I would take it it's minimizing a minimal risk.
10 Whether that provides a greater assurance of lack of
11 hazard or not is open to interpretation.

12 Q. Dr. Ritter?

13 DR. RITTER: A. No, I don't think you
14 can conclude that going from a hundred to a thousand
15 increases a margin of safety.

16 I think the point Mr. Kingsbury made was
17 that the conclusion in many of the papers that you have
18 been referring to is at a specified distance there was
19 virtually no human exposure; that is not to say that at
20 half that distance there was also not virtually no
21 human exposure.

22 So if you go from a hundred feet where
23 there is no exposure to a thousand feet, you still have
24 no exposure but actually you haven't added any margin
25 of safety. There wasn't any risk at a hundred feet.

1 Q. All right. Then I have one question
2 that remains with respect to this area - and, again,
3 perhaps I should have asked this earlier but it wasn't
4 apparent to me - but could we have a list of the
5 studies that Ministry of the Environment and MNR used
6 to reduce the levels to 240 metres and 120 metres,
7 given we are advised that those deal with human health
8 effects and they were based upon some evidence that
9 this was safe for human health purposes?

10 MS. MURPHY: First of all --

11 MS. KLEER: Well, I apologize but I think
12 it's importance.

13 MS. MURPHY: Not to be facetious, if my
14 friend wants to hear about studies that indicate
15 whether these products were safe for human health,
16 period, Dr. Ritter has been giving that evidence for
17 weeks.

18 MS. KLEER: No, I am not asking that. I
19 am only asking for specific studies that the Ministry
20 of the Environment and MNR relied upon in order to
21 reach a conclusion that the 120-metre and 240-metre
22 buffer zones referred to and that are still in use
23 today are acceptable from a human health perspective.

24 THE CHAIRMAN: Mr. Kingsbury, are you
25 aware that there were any such studies that

1 specifically the two ministries relied upon in
2 formulating the '86 reductions?

3 MR. KINGSBURY: Certainly throughout
4 this -- the period we are talking about, there was very
5 active research going on in terms of drift of spray and
6 modeling as well. As to what specifically were done, I
7 am not sure. I certainly couldn't answer the question
8 as to what studies were considered.

9 I would say that definitely there was a
10 different body of literature available; the extent to
11 which it was used I am not sure.

12 MS. MURPHY: I don't think we can do
13 anything more than what we had discussed doing earlier
14 which was to get together with Ms. Seaborn and discuss
15 it. It's the same question as far as I can tell.

16 THE CHAIRMAN: All right. Why don't we
17 leave it on this basis, Ms. Kleer: Counsel get
18 together and discuss this question privately and see if
19 an accommodation can be worked out as to what you would
20 like to see have produced and what there is, if
21 anything available, and if you don't get any
22 satisfaction at that point, then the Board will look at
23 the question once again.

24 MS. KLEER: I am satisified with that

25 MR. SUTTERFIELD: Mr. Chairman, could I

1 possibly have a clarification. As I understand it, Ms.
2 Kleer is asking for two things; the literature review
3 for the 1984/85 buffer and what studies and the
4 literature review for the 1985 buffer?

5 Are those two distinct and separate?

6 MS. KLEER: Well, literature review and
7 studies relied on are what I am looking for for both --

8 MR. SUTTERFIELD: For the creation of the
9 84/85 and the '86?

10 MS. KLEER: Yes, that is what I am lookig
11 for.

12 MR. SUTTERFIELD: Thank you.

13 THE CHAIRMAN: And there may not be a
14 difference in the literature.

15 MS. KLEER: That may well be.

16 THE CHAIRMAN: Necessarily.

17 MS. KLEER: I just want to determine what
18 it is.

19 Q. Now, in '84 and '85, sensitive areas
20 included berry picking areas and there were different
21 sets of buffer zones for the sensitive areas and they
22 were 120 metres for the herbicides 2,4-D and glyphosate
23 and 300 metres for aminocarb, fenitrothion and
24 carbaryl.

25 Now, when I look at the definition of

1 sensitive area in the present buffer zone guidelines I
2 don't see any reference to berry picking areas. Would
3 you agree with me?

4 MR. KINGSBURY: A. They are not
5 specifically -- berry picking areas is not specifically
6 listed under sensitive areas. There is a footnote
7 saying:

8 "Existing Ministry of Natural Resources
9 Guidelines re: noise and disturbance
10 around endangered or sensitive species
11 habitats will be adhered."

12 Which I would assume has no reference to
13 berry picking areas. So, yes, I would agree.

14 Q. Now, at the bottom of page 38 there
15 is a paragraph that seems to address this and I am
16 seeking some clarification as to why these raspberry
17 picking areas or berry picking areas are no longer in
18 the table. And I think this paragraph provides some
19 help, but perhaps you could indicate what your
20 understanding of this removal is based upon?

21 A. I am afraid I would be unable to
22 offer anything that would be beyond pure speculation.

23 Q. Now, the Ontario buffer zones don't
24 specifically establish a guideline for municipal water
25 supplies that I can see.

1 However, at the front of this set of
2 proceedings on the buffer zone there was a table that
3 was prepared, a summary table setting out the buffer
4 zones for each of the jurisdictions and I will
5 introduce it now, but I guess what I am going to refer
6 to specifically is the municipal water supplies and
7 what it is in Ontario.

8 (handled)

9 THE CHAIRMAN: Thank you. Exhibit 804.

10 ---EXHIBIT NO. 804: Two-page document entitled:
11 Table 1. Summary of buffer zones
12 applied to spruce budworm control
 operations in various
 jurisdictions, April, 1986.

13 MS. KLEER: Q. Now, turning to the
14 second page there under the heading: Water Supply
15 Intakes, it indicates that the water supply intake for
16 Ontario creates a buffer zone of 120 metres. Is that
17 what you see there as well?

18 MR. KINGSBURY: A. That's correct.

19 Q. And you would agree that is
20 substantially smaller than the buffer zones for Quebec,
21 New Brunswick, Maine with respect to chemical
22 insecticides and Newfoundland as well?

23 A. That's correct.

24 Q. And those for Quebec and New
25 Brunswick, Maine and Newfoundland respectively those

1 buffer zone sizes are - and I am only looking at the
2 small aircraft now - 3 kilometres, 3.2 kilometres, 1.6
3 kilometres, and in Newfoundland where there is no
4 distinction made 1.6 kilometres; is that correct?

5 A. That's correct. And I would also
6 point out that for biologicals the differences go from
7 nothing to 3.2 kilometres. It's certainly an area
8 where different jurisdictions have a wide range of
9 buffers.

10 Q. I haven't been dealing with the BT
11 zones at all. Sir, you would agree - well, I am sorry,
12 I already asked that question.

13 How does that compare to Ontario's buffer
14 zone for critical habitats which is on the first
15 page -- I am sorry, critical fisheries.

16 MS. MURPHY: Excuse me. Are we finished
17 with municipal water supply?

18 MS. KLEER: All I wanted to establish was
19 that there is a difference, yes.

20 MS. MURPHY: So you are not going to
21 point out the reference to municipal water supplies in
22 this --

23 MS. KLEER: Oh, I'm sorry, could you
24 refer this to me.

25 MS. MURPHY: Yes. The policy that has

1 been referred to -- or the guideline which is at page
2 166 does, as was pointed out, has a series of notes and
3 you will note that the third paragraph indicates - and,
4 as you know, that these operations are planned on a
5 case-by-case basis and provided to the Ministry of the
6 Environment for a permit - and it advises here:

7 "Increased buffer zones may be considered
8 in specific situations such as communal
9 and municipal water supplies."

10 And registered bee yards is another
11 example. So it's advised at the front that those
12 matters will be dealt with on an individual basis in
13 the application for permit.

14 MS. KLEER: All right. I apologize, I
15 hadn't read that.

16 Q. Would you confirm, however, that
17 there is no set zone, it's negotiated on an individual
18 basis?

19 MS. MURPHY: I think it speaks for
20 itself.

21 MR. KINGSBURY: If I might just comment
22 on that. Earlier we looked at a permit from the
23 Province of New Brunswick. That in fact is the format
24 of the permits.

25 MS. KLEER: Q. In Ontario?

1 MR. KINGSBURY: A. I believe that that
2 would be the -- in Ontario a spray permit would be
3 similar, okay. The tables that you see here are
4 prepared primarily for the purposes of this workshop,
5 okay, to establish them.

6 That doesn't mean they are the actual --
7 what the permit says, and if you notice that the
8 specific permit that we looked at for New Brunswick
9 didn't have a table such as this, it had a list of
10 paragraphs.

11 So, again, it would be most appropriate
12 to refer directly to a spray permit.

13 Q. All right.

14 A. Which might have an additional
15 consideration such as the one Ms. Murphy brought up.

16 Q. Well, that raises an interesting
17 question then. When you have a permit--

18 A. Yes.

19 Q. --these are only guidelines and, in
20 fact, is it true that these guidelines are not an
21 assurance that what you are going to have in the permit
22 is going to be the same as what's in the guidelines?

23 MS. MURPHY: I think we better clarify
24 one matter. My understanding of what Mr. Kingsbury
25 just said is -- I think he was referring to this

1 exhibit when he said this table was put together for
2 the workshop.

3 I think that might be causing some
4 confusion. I think my friend might have understood him
5 to be referring to page 166 which is not what he was
6 discussing, he was discussing the exhibit which is the
7 study taken out of the workshop.

8 MS. KLEER: No, that wasn't my question.
9 My question was -- I think he was pointing out that
10 spray permits look to the guidelines but...

11 MR. KINGSBURY: A spray permit may have a
12 lot more information than what you see in this table.

13 MS. KLEER: Q. All right.

14 MR. KINGSBURY: A. This table is --
15 actually the editors of the workshop proceedings
16 attempt to put out for comparison side-by-side these
17 values. We sent them back to the authors to review and
18 say: Yes, they agreed. But in this one table, which
19 was quite an endeavor to put together, it was
20 impossible to capture each and every caveat or whatever
21 that might be contained in the actual permits issued.

22 Q. All right.

23 A. And in fact they are dynamic things.

24 Q. Okay. I have no problems with that.
25 I am glad you pointed that out and clarified that.

1 THE CHAIRMAN: In any event, is it not
2 true that whatever tables are used, for instance on
3 page 166 of the witness statement, they are meant to be
4 minimum values and consequently on a case-by-case basis
5 they may be larger?

6 MR. KINGSBURY: Yes, and they are
7 conditions of permit.

8 THE CHAIRMAN: All right.

9 MR. KINGSBURY: Okay. So that they --

10 THE CHAIRMAN: Could they be smaller than
11 the guidelines on a case-by-case basis?

12 MR. KINGSBURY: Not unless the permit
13 specifically said this buffer zone restriction is
14 waived for this use in this place or whatever.

15 MS. MURPHY: For the record, I would
16 point out that an example of a permit with the
17 conditions and with this -- the table that is on page
18 166 attached under the letterhead of the Ministry of
19 the Environment is at page 758 of the statement of
20 evidence for Panel 15, there is one example in there,
21 Volume II, page 758 and following.

22 THE CHAIRMAN: Thank you.

23 MS. KLEER: All right. I have one small
24 area yet to cover that has to do with the monitoring
25 compliance with the permit buffer zones.

1 Q. Now, in Ontario are you aware of what
2 kind of enforcement of the observance of buffer zones
3 is in place?

4 MR. KINGSBURY: A. I guess, first of
5 all, I would say that; one, that's MOE's jurisdiction.

6 Q. All right.

7 A. And certainly not something I have
8 been involved with and probably not the best person to
9 speak to it.

10 MS. MURPHY: And I would add that in an
11 earlier part of this group we had Mr. Iskra who talked
12 about what was done inside the Ministry of Natural
13 Resources, as well as Mr. Nicholson. Both of those
14 gentlemen talked about operations and how they are
15 governed and controlled inside the Ministry of Natural
16 Resources.

17 THE CHAIRMAN: And at some point, no
18 doubt, we will have evidence from the Ministry of the
19 Environment.

20 MS. MURPHY: I am not privy to that.

21 THE CHAIRMAN: No, obviously, but it's
22 probably likely.

23 MS. KLEER: Q. Are you aware, Mr.
24 Kingsbury, whether Ontario has any records of the
25 compliance, for lack of a better word, with buffer

1 zones; i.e., what I am referring to is the fact that I
2 understand in Maine - and this is based upon my reading
3 of the report filed earlier about Maine - that they
4 actually have a written report that is prepared by a
5 government official who flies along with the party who
6 is spraying and they fly along in a plane behind them
7 and they mark deviations from the buffer zones.

8 Are you familiar -- first of all, are you
9 familiar with that being Maine's process?

10 MR. KINGSBURY: A. I recognize some
11 jurisdictions in some years have done that, but as to
12 when and how and in what procedure MOE goes through to
13 do that, I wouldn't be confident to give evidence.

14 THE CHAIRMAN: Ms. Kleer, wouldn't that
15 more properly be compliance monitoring, Panel 16?

16 MS. KLEER: I am not certain that that is
17 going to be dealt with in Panel 16.

18 MS. MURPHY: By and large, to a large
19 degree when speaking to compliance monitoring, we
20 advise that the witnesses in Panel 12 and 13 with
21 respect to operations would be providing that
22 information for the Ministry of Natural Resources.

23 There would be very little additional in
24 Panel 16 given that those witnesses who do the
25 operations, explained - from the Ministry of Natural

1 Resources' point of view - all of the paper, everything
2 that is collected, all of the records and, in fact, in
3 interrogatories to that group we were asked to provide
4 information based on those kinds of records and did so.
5 I don't see any value in repeating all of that, is my
6 point.

7 MS. KLEER: Q. Okay. Let me just leave
8 it at this point. Are you aware that Maine enforces in
9 the way that I have previously described?

10 MS. CRONK: Again, is there a distinction
11 between insecticides and herbicides?

12 MS. KLEER: Pardon me, with respect to
13 insecticides.

14 MS. CRONK: Thank you.

15 MR. KINGSBURY: I am aware that some
16 jurisdictions have periodically. I don't think any
17 jurisdiction does it routinely on all spray operations.
18 Currently that is my understanding.

19 MS. KLEER: Q. And would you agree that
20 that is a fairly -- doing it in that way would be a
21 fairly accurate way of determining that those buffer
22 zones are being complied with?

23 MS. CRONK: Sorry, just before you answer
24 the question, Mr. Kingsbury.

25 THE CHAIRMAN: I am sorry, go ahead.

1 MS. CRONK: That is fine, Mr. Chairman.
2 I have difficulty with this whole line of questioning.
3 The way it commenced was with Ms. Kleer saying: It's
4 my understanding based on what I take to be Exhibit 802
5 the following happens in the State of Maine with
6 respect to process.

7 I didn't take any objection to that, she
8 was just indicating what her understanding is and
9 that's fair enough.

10 But she then went on to ask this witness,
11 never confirmed that that was his understanding of the
12 process, we haven't had established that that is the
13 current practice, it wasn't even differentiated between
14 insecticides and herbicides and they haven't used
15 chemical insecticides in Maine for some time.

16 Since Ms. Kleer seems to be giving
17 evidence on the process, maybe I can sneak that one in.
18 That is my understanding.

19 So I have a lot of trouble with now
20 asking a witness who is not from Maine, who has not
21 professed any expertise or knowledge about Maine
22 process to now talk about it's adequacy.

23 I am sorry, I know it's late in the day,
24 but I really do feel that is an improper question.

25 MS. KLEER: All right. I think -- let me

1 rephrase the question.

2 Q. Mr. Kingsbury, are you aware of how
3 other jurisdictions monitor compliance with buffer
4 zones?

5 MS. MURPHY: I think that is one he has
6 answered and he has said he's aware that in some
7 places, at some times, never all the time somebody goes
8 along. And I think he answered that question.

9 I think it might be interesting to
10 consider who is there because there is always someone
11 there, Mr. Chairman.

12 MS. KLEER: Well, I think we have
13 already -- all right.

14 Q. That is your answer, that you have
15 some knowledge; is that correct, of other
16 jurisdictions?

17 MR. KINGSBURY: A. That's right. And
18 periodically people have gone out in spray cars, et
19 cetera.

20 Q. All right. And would you agree that
21 doing it in that fashion is an effective way of
22 monitoring compliance with a buffer zone?

23 MS. CRONK: Same objection.

24 THE CHAIRMAN: Well, I think, Ms.
25 Kleer --

1 MS. KLEER: I guess I am missing it. I
2 think he has indicated that he is aware that that is
3 one way in which buffer zones are -- or compliance with
4 buffer zones is monitored.

5 THE CHAIRMAN: He says he's aware that
6 from time to time certain jurisdictions have done that.

7 MS. KLEER: All right. And then I am
8 asking, in his opinion, is that an effective way. That
9 is all I am asking.

10 THE CHAIRMAN: Without reference to any
11 particular jurisdiction?

12 MS. KLEER: No, I am just dealing -- I am
13 asking on a general level.

14 THE CHAIRMAN: And with reference to the
15 monitoring of aerial spraying of insecticides?

16 MS. KLEER: Yes, only with insecticides.

17 MS. CRONK: In the State of Maine?

18 MS. KLEER: No.

19 THE CHAIRMAN: Well, no, just in general.
20 Is that an effective way to monitor compliance with
21 buffer zones for aerial spraying for insecticides, just
22 in general.

23 MS. MURPHY: And the question is: Is
24 that an effective way -- to have someone going along
25 and looking, is that an effective way?

1 THE CHAIRMAN: That's right, with a plane
2 following.

3 MS. KLEER: And filing a written report.

4 MS. CRONK: No objection.

5 THE CHAIRMAN: Okay. Just from your own
6 general knowledge, if you can answer the question, do
7 you feel that's an effective way?

8 MR. KINGSBURY: If the resources are in
9 place and the observers are trained and competent in,
10 you know, the navigation of aircraft over land spaces
11 and capable of recording that, certainly it's a way
12 that it could be done. I guess I would have some
13 reservations about its -- the ability to, on a large
14 scale, carry out that kind of compliance monitoring.

15 MS. KLEER: Q. I'm not asking about cost
16 effectiveness, I'm just asking about effectiveness.

17 MR. KINGSBURY: A. I wasn't thinking
18 cost effectiveness in my last comments, I'm thinking
19 about some of the other constraints on it.

20 Q. All right. I'm not going to ask any
21 further questions at this point.

22 MS. MURPHY: If I could just remind you,
23 Mr. Chairman, of the evidence of Mr. Iskra earlier in
24 this panel in which he discussed a particular project
25 and discussed the procedures that are followed in

1 aerial applications of insecticides, is what he was
2 talking about.

3 He talked about the person -- the people
4 who go along as observers, bird dogs he called them
5 various things, and he also discussed all of the
6 records that were made and how they were collected at
7 the end of those projects.

8 I know -- and, again, it was some time
9 ago, I would just like to remind you that he did do
10 that.

11 MS. KLEER: Thank you. I'm glad that
12 I've been reminded of that, I had forgotten that. So
13 we have some evidence at any rate of how Ontario goes
14 about monitoring. All right.

15 I have no further questions.

16 THE CHAIRMAN: Thank you, Ms. Kleer.

17 Okay, ladies and gentlemen, before we
18 probably take a short break, if Mr. Hanna has further
19 questions -- Mr. Hanna, do you have further questions
20 at this time?

21 MR. HANNA: Mr. Chairman, I have taken
22 the Board's instruction and that of other counsel and
23 reviewed my cross-examination.

24 In looking at my cross-examination many
25 of the questions that were eliminated were questions

1 where I would have gone into more detail, whatever. In
2 order to retrieve that, I believe it would be extremely
3 redundant in terms of -- at this stage trying to do that.

4 Given that, I do not feel that it's in
5 the best interest of the Board or the public to take
6 the Board's time in doing that now. I will endeavour
7 to try and cover those matters in my evidence-in-chief
8 and hopefully that will deal with the issues that I
9 would have preferred to have dealt with in this
10 witness, but I will have to deal with --

11 THE CHAIRMAN: Well, are there any
12 particular points that you feel you didn't have an
13 opportunity to adequately cover that you specifically
14 want to cover?

15 MR. HANNA: I think my answer to that is,
16 yes, there were, but I will cover them through my
17 evidence-in-chief.

18 THE CHAIRMAN: Okay. Thank you.

19 Ladies and gentlemen, before we rise for
20 the evening, I take it you are not prepared to go on
21 with any re-examination tonight?

22 MS. MURPHY: I'd prefer not at this point
23 in time, Mr. Chairman.

24 THE CHAIRMAN: All right. Well, we are
25 going to have a little discussion as to how long you

1 are going to be and when we will be tomorrow based on
2 that, but the Board wants to canvass two other matters
3 briefly.

4 Firstly, we would like to exhibit the
5 report on the Board's site visit which occurred May
6 23rd through May 26th. I believe copies are on the
7 reporter's table and in the usual practice I think we
8 will -- I believe we gave these exhibit numbers.

9 MS. MURPHY: Yes, that's true.

10 THE CHAIRMAN: We will exhibit it as No.
11 804.

12 MR. HANNA: 805, I believe, Mr. Chairman.

13 THE CHAIRMAN: I have 804 this would be.

14 MR. HANNA: I have a table that was just
15 introduced by Ms. Kleer, Table 1. Summary of the buffer
16 zones applied to spruce budworm control as 804. Maybe
17 I have that marked wrong, Mr. Chairman.

18 MS. BLASTORAH: That was 804, Mr.
19 Chairman. I believe the next exhibit number is 805.

20 THE CHAIRMAN: Oh, I'm sorry, that's
21 correct. Thank you, Mr. Hanna.

22 So this will be Exhibit 805. And if
23 there are insufficient copies for everybody, let us
24 know and we will arrange for some more.

25 ---EXHIBIT NO. 805: Report on the Board's Site Visit

1 May 23rd through May 26th, 1989.

2 THE CHAIRMAN: Now, with respect to
3 scheduling in future, the Board has had a further
4 discussion over scheduling and we would like to propose
5 the following to implement not next week but the
6 following week and; that is, that we sit for entire
7 days on Tuesdays, Wednesdays and Thursdays and that
8 means: Coming in Monday evenings for an 8:30 start on
9 Tuesdays, sitting is full day on Tuesday, a full day on
10 Wednesday and commencing 8:30 on Thursdays and sitting
11 until not later than six o'clock and not sitting on
12 Mondays and not sitting on Fridays.

13 And our feeling is - and we have tried to
14 work out mathematically the number of hearing hours
15 that we are averaging - we feel we will actually
16 increase the number of hours that we will have
17 available for sitting and we feel it will eliminate the
18 situations whereby parties are reluctant to move into a
19 new area because we are only going to be available for
20 half a day on both Monday afternoons and Thursday
21 afternoons -- Thursday mornings, rather.

22 In this way parties will also be able, in
23 our view, to possibly better prepare for the start on
24 Tuesday after a weekend, having Monday available to do
25 so rather than flying in Monday morning and being ready

1 to start Monday afternoon when the last attendance was
2 the week before, and that will also preserve Fridays
3 for other business for both the Board and the parties.

4 Now, we feel that this would not be
5 applicable to next week's sitting, but we would like to
6 try it the week after and, once again, parties could
7 come in at their leisure on Monday, provided that they
8 are in some time Monday night so that they could
9 commence early on Tuesdays.

10 Occasionally the Board would even sit
11 lengthier hours on Tuesdays or Wednesdays in order to
12 finish a specific portion of evidence if that became
13 necessary. We would not sit later than six o'clock at
14 the latest on Thursdays to enable people to take the
15 seven o'clock plane out of here. I think there is a
16 plane at seven and nine.

17 MS. BLASTORAH: Right now there is, Mr.
18 Chairman. I understand the schedules change regularly
19 and I think I would just caution that --

20 THE CHAIRMAN: Well, we will have to deal
21 with that if the schedules change.

22 We would anticipate starting regularly at
23 8:30 in the mornings and probably go through until 5:30
24 each day.

25 The parties would realize that we are

1 sitting essentially very regular hours and, according
2 to our instructions of last week, be prepared to move
3 along when the party preceding has finished. Parties
4 will, again, be expected to monitor the proceedings
5 and, in that fashion, we feel that we can eliminate
6 some of the problems of the two half days and also not
7 sacrifice any additional hearing time.

8 So this is what the Board would like to
9 try. Do we hear any objections which we will consider
10 but not necessarily agree with.

11 MR. CASSIDY: Sorry, when did you
12 anticipate commencing this?

13 THE CHAIRMAN: The 18th.

14 MS. MURPHY: The 19th.

15 THE CHAIRMAN: Sorry, it would be the
16 19th but we would arrive here the evening of the 18th.

17 Okay. Now tomorrow morning the departure
18 time, as I understand it, is 11:45.

19 MS. MURPHY: The departure time from this
20 room?

21 THE CHAIRMAN: No, the departure time
22 from the--

23 MS. MURPHY: From the airport?

24 THE CHAIRMAN: --runway is 11:45.

25 MS. BLASTORAH: 6:00 a.m. start or

1 something.

2 THE CHAIRMAN: You indicated that we
3 would be out of here by 11:45, that poses a problem,
4 bearing in mind that the next departure time is 5:10
5 or --

6 MS. MURPHY: That was a misunderstanding
7 on my part. I had understood that you wanted to be out
8 of this room by 11:45. My goodness.

9 THE CHAIRMAN: Because of some
10 circumstances tomorrow it necessitates the Board being
11 back in Toronto by early afternoon. So as a
12 consequence, we can do one of two things: We can take
13 some of your re-examination later this evening or we
14 can start very early, or I suppose...

15 MS. BLASTORAH: I assume it's probably of
16 little assistance to the Board, but I just would advise
17 I believe there is a 4:10 flight.

18 THE CHAIRMAN: No, but that...

19 MS. BLASTORAH: Still too late?

20 THE CHAIRMAN: That misses -- right.
21 There is a meeting set up for the afternoon that I must
22 attend. I have to be there by two o'clock or 2:30 in
23 the afternoon.

24 MS. MURPHY: I mean, my difficulty is
25 that I have undertaken to you if we started at eight to

1 finish by the time you wanted to leave, which I thought
2 was 11:45.

3 THE CHAIRMAN: So that is three hours and
4 forty-five minutes.

5 MS. MURPHY: Yes.

6 THE CHAIRMAN: Well...

7 MS. MURPHY: I would be hesitant to try
8 to take any time this evening. You can appreciate not
9 only has it been a long day, but if I'm going to be
10 efficient and short tomorrow it takes a long time to
11 prepare to be short.

12 THE CHAIRMAN: What if we started at
13 seven?

14 MS. CRONK: Could I just point out, sir -
15 only because I know that this will also be considered
16 and perhaps not followed - but that does mean 5:30 for
17 for some of us who are not used to spray hours, and to
18 the extent that that's relative --

19 THE CHAIRMAN: Remember--

20 MS. CRONK: It's not an objection.

21 THE CHAIRMAN: --the bees won't be out at
22 that time foraging.

23 MS. CRONK: It would be hard to even find
24 this hotel at 5:30 in the morning.

25 MR. CASSIDY: Are you intending to take

1 attendance tomorrow?

2 MS. MURPHY: Will you be able to make
3 your flight if you leave here at eleven?

4 THE CHAIRMAN: Yes, I think I can arrange
5 to get boarding passes and all those kinds of things,
6 so I just have to physically get from here to there in
7 time before the door closes.

8 MS. BLASTORAH: I can drive you in 15
9 minutes.

10 MS. CRONK: That wasn't a serious
11 objection, sir, and if you want to start at seven
12 obviously...

13 MS. MURPHY: Well, I would prefer - and I
14 know it will take some effort - but I would prefer to
15 start at eight and finish at eleven.

16 THE CHAIRMAN: Okay. We realize that it
17 is a problem with this panel because of their
18 availability.

19 MS. MURPHY: Yes, I know.

20 THE CHAIRMAN: I mean, obviously, we
21 would like to err on the side of caution as opposed to
22 finding out that in fact you don't finish, because then
23 I think it will be a problem for Dr. Ritter.

24 MS. MURPHY: Well, split the difference,
25 7:30.

1 THE CHAIRMAN: Okay.

2 MS. MURPHY: As you can appreciate, not
3 only is there a time to get those things organized, but
4 I would like to have my paper ready for you and that
5 sort of thing and that makes it difficult.

6 THE CHAIRMAN: Well, it's your
7 examination, we don't know what you want to ask. So it
8 is basically up to you whether you feel you can finish.

9 We are willing to appear at whatever hour
10 would allow you to finish by eleven o'clock, and that
11 includes maybe not even leaving.

12 MS. CRONK: The last time somebody made
13 Mr. Cassiday attend in court, sir, at 7:30 in the
14 morning he got costs on a solicitor and client scale
15 payable forthwith.

16 THE CHAIRMAN: Fortunately or
17 unfortunately we don't have the cost power in this
18 hearing.

19 MS. CRONK: The request was directed that
20 way, sir, to my left.

21 MS. MURPHY: I am sort of on the spot
22 here. I would still prefer to start at eight and
23 undertake to finish at eleven.

24 THE CHAIRMAN: Okay, that's fine.

25 MS. BLASTORAH: Everyone can speak very

1 quickly.

2 THE CHAIRMAN: Oh yes. Okay. That
3 finishes that one issue. Now, let's go on to next
4 week. With respect to the schedule for next week, do
5 you have any idea, Mr. Hanna...?

6 I know that there was some conversations
7 between you and Mr. Mander yesterday with respect to
8 your examination starting next Monday. Do you have any
9 idea at this time how long you will take?

10 MR. HANNA: Mr. Chairman, Mr. Mander had
11 relayed to me that the Board was desirous of us being
12 completed by Tuesday.

13 THE CHAIRMAN: Tuesday night.

14 MR. HANNA: Yes, sir, Tuesday evening
15 and my intention is to adhere to that to my very best
16 ability. I can perhaps advise the Board of some - how
17 do you say - relief that I haven't prepared my
18 cross-examination yet in full, and so that will allow
19 me to have some ability to make it fit to the cloth of
20 the --

21 THE CHAIRMAN: Because what we have done,
22 Mr. Hanna, is we have arranged or have indicated that
23 the re-examination will take place of Panel 14 on
24 Wednesday morning and Panel 15's direct evidence will
25 commence Wednesday afternoon.

1 MR. HANNA: Mr. Chairman, I have been
2 advised of the schedule the Board is trying to set up
3 and, as I say, I will fit the cloth for the time that's
4 available.

5 THE CHAIRMAN: Okay. Thank you very
6 much. Very well, we will adjourn until 8:00 a.m.

7 Thank you.

8 ---Whereupon the hearing adjourned at 5:45 p.m., to be
9 reconvened on Friday, September 8th, 1989,
 commencing at 8:00 a.m.

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E R R A T A

VOLUME 128

<u>Page No.</u>	<u>Line No.</u>	<u>Correction</u>
21724	11	For "roads are going in", please read: "roads are growing in".
21724	16	For "we drew population inventories", please read: "we do population inventories".

